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COOK ISLANDS CEREMONIAL STRUCTURES
— Diversity of *Marae* and Variety of Meanings —

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(c) Toru Yamaguchi

— ABSTRACT—

Ethnographic accounts recorded from a number of its islands illustrate that *marae* or ceremonial structures in East Polynesia are richly polysemic, their significance spreading out in an embarrassment of directions (cf. Geertz 1980: 105). Yet, it is fair to say that archaeologists have hardly approached the great variety of meanings encoded in *marae*. Most previous studies have generally constrained inquiring into the local characteristics of ceremonial structures in order to build general models of social evolution. Critical reconsideration of these insights provides a new perspective derived from contextual archaeology. The principal aim of this study, therefore, is to interpret a variety of local meanings encoded in *marae* in the Cook Islands in accordance with this new perspective. For this purpose, I document the considerable diversity of ceremonial structures in this island group, mainly on the basis of data which were collected during the 1985, the 1989 – 1991 and the 1995 – 1996 Keio University Expeditions to the Cook Island Group including my own 1995 research in Tongareva Atoll.

It would, however, be impossible to interpret all the meanings encoded in Cook Island ceremonial structures. Therefore, I focus on the concept of 'cultural landscape.' It is a product which has been formed by interaction between a local culture and a local environment or by human imposition of local meanings onto a local environment (cf. Ucko 1994: xviii). Seen in this light, we can view construction of ceremonial structures as a physical action of such an event. The concept of cultural landscape, thus, involves us in taking up the issue of why *marae* provided with particular morphological characteristics exists a particular locale. Data related to this issue include the morphology of elements comprising a *marae*, the configuration of these elements comprising a *marae*, the configuration of these elements, its orientation, and the various features related to its location. They also include the spatial associations with other architectural features, and more general aspects of the cultural context. And comparison of these visible characteristics among *marae* — along with ethnographic accounts — provide us suitable contexts relevant to examining various set of meanings encoded in each *marae*.

The substantive research includes three case studies. The first of them

demonstrates that *marae* are intimately related to certain aspects of the Tongarevan prehistoric society in the Northern Cook Islands which include economic, social and political as well as ideological and cosmological factors. It is also noteworthy that every *marae* does not necessarily share the same set of meanings. This reflects a situation in which *marae* turn out to be associated with various socio-political levels — ranging from households to the entire atoll — formed within a society that is segmentary in nature. *Marae* thus carry a variety of meanings peculiar to each social unit at various levels, as well as serving as territorial markers at a main socio-political level, that of the level of largest and most stable social units called *huaanga*.

The perspective developed in the analysis of Tongarevan case — ceremonial structures are richly polysemic — is also the analytical basis of next two case studies of religious structures of Rarotonga and Mangaia in the Southern Cook Islands. The comparison among the three islands, however, provides still another viewpoint. *Marae* in the islands exhibit homogeneous or heterogeneous pattern in morphology and location, but these patterns are not directly related to the degrees of socio-political complexity. This suggests that the realization of the local meanings which vary relative to islands must be examined in detail before linking too facilely ceremonial structures with political hegemony or social evolution in some overall framework.

The above perspective derived from three case studies leads to a reconsideration of the diversity of ceremonial structures in the Cook Island Group and throughout East Polynesia. First, the diversity can be observed most directly in the Cook Islands. This is quite sufficient to cause a revision of the prevailing image that East Polynesian ceremonial structures all share basic morphological elements. If we do not aim at constructing a general model of ceremonial structures, but instead scrutinize the diversity, it becomes necessary to refer to sets of local meanings varying not only within island and island but also within *marae* by *marae*. I believe this may prove to be an effective approach for a new range of *marae* studies. Moreover, it would also contribute to the development of a more recent perspective designated 'landscape archaeology' which aims at approaching various aspects of the built environment including physical, social, economic and ideological ones.

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The Keio University team has undertaken the following archaeological surveys in the Cook Islands — founded by the International Scientific Research Foundation, the Ministry of Education of Japanese Government (Grant No. 01041081 and No. 07041022) — since 1985:

(1) the 1985 expedition in Pukapuka in the northern group,
(2) the 1989 expedition in Tongareva in the northern group,
(3) the 1990 expedition in Manihiki and Rakahanga in the northern

group,

(4) the 1991 expedition in Manihiki in the northern group and Rarotonga in the southern group,
(5) the 1995 expedition in Pukapuka in the northern group,
(6) the 1996 expedition in Rarotonga in the southern group, and
(7) the 1997 expedition in Rarotonga in the southern group.

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Chapter 1

Introduction

Ceremonial structures are widely distributed among the islands of East Polynesia. They are called *marae, me'ae, heiau* or *ahu*. Many of them share basic morphological elements such as "an enclosed or otherwise delineated courtyard, elevated altar area *(ahu)*, and upright stone slabs or carved images" (Kirch 1982: 80). However, they are also diversified in their size, orientation, and location. In particular their collective configurations may vary at the district level of an island as well as within islands of a group or between island groups.

Because of their number, the monumental size of many of these structures, their similarity and their diversity, these ceremonial structures have been viewed as one of most marked cultural phenomena of East Polynesia (Garanger 1967: 383). These structures have also fascinated European voyagers, travelers, traders and settlers who have visited the islands since the early 18th century. They recorded rituals performed at several islands in their descriptions or drawings. Such records demonstrate that the structures were ritual places. However, their accounts were not necessarily based on sufficient insights into the details of Polynesian culture and its religion, so included exaggerated, inaccurate or vague statements.

The majority of more reliable information was not accumulated until the 1920's when the Bishop Museum systematically carried out archaeological and ethnological surveys (Emory 1943: 9). It is very evident by that time that most of islands were strongly westernized and had lost or were in the process of losing their traditions about such matters as ritual and cosmology. In this situation, salvage surveys of the Bishop Museum yielded a mass of invaluable records, and many scholars frequently refer to

these records even at present. In keeping with this accumulation of information, both studies of the ceremonial architecture itself and those interpretations using it as the main part of their data have progressed by employing several perspectives, each reflecting world archaeological trends.

Recent theoretical writings in archaeology often search for a current perspective by employing a stance such as 'post-new archaeology' or 'post-processual archaeology.' The studies of ceremonial architecture in East Polynesia are not exempt from this trend. In order to address these new perspectives to analyses, it would be useful to scrutinize — with a mind to the world trends — preceding studies which have been put forward over the last 70 years. In this chapter, they are classified into three perspectives — the culture-historical, processual, and structural — each of which is examined separately. Thereafter, I propose a new theoretical framework and a set of analytical procedures useful in carrying out my analyses of East Polynesian ceremonial structures, with the focus on those found in the Cook Islands.

1.1. Perspectives to Ceremonial Architecture

1.1.1 Culture-historical Perspective

The extensive and systematic surveys carried out by the Bishop Museum originated from the First Pan-Pacific Science Congress held in 1920. The Congress "proclaimed the 'problem of Polynesian origins' to be one of the pressing scientific concerns" (Kirch 1992), and this led to mapping out what turned out to be over 40 years of study of ceremonial architecture. Kenneth P. Emory's works, in particular, characterize this trend.

In 1925, Emory surveyed 240 archaeological sites throughout the Society Islands. Using these data, he classified *marae* of the Windward Islands into

three types: inland, intermediate and coastal. He also identified another type of *marae* in the Leeward Islands. The intention of this quadripartite classification was to outline a developmental and chronological framework for the ceremonial architecture of this island group. It ranges from the simpler inland type through the intermediate and the Leeward types to the more sophisticated coastal type (Emory 1933: 40-1). He vigorously continued a series of surveys: Nihoa and Neker in the Hawaii Islands (Emory 1928), the Tuamotu Archipelago (1934a), the Gambier Islands (1939) and the Line Islands (1934b) as well as expanding his investigations in the Society Islands. Using his extensive data and information about *marae* of other islands including Tongareva Atoll, he set out morphological similarities and differences in ceremonial structures as a basis from which to infer a developmental and diversifying sequence for such structures in East Polynesia (Emory 1943, 1970).

Emory also collected ethnographic and ethnohistorical information wherever possible. It is, in particular, notable that he "encountered for the first time Polynesians who were sufficiently removed from the influences of Western civilization" (Kirch 1992: 4) and he compiled a variety of indigenous concepts related to Tuamotuan *marae*. In this monograph, he set out a fundamental general point:

> The maraes, as the property of kindred, were material symbols of them, and formed a visible connection with the past. Always standing on the land occupied by the kindred, observable by any who might pass, they came to be a seal of ownership. They bound the ancestral spirits and gods of the kindred to the land, putting it under their eternal guardianship. [Emory 1947: 10 (underlining mine)]

Surprisingly, this paragraph foreshadowed a forthcoming perspective. In fact, Renfrew (1984: 180), referring to it, emphasized that Tuamotuan *marae* functioned as territorial markers, a basic concept of current spatial studies that examine the management of resources and political stratification in prehistoric societies.

Emory, however, largely failed to explore, on the basis of analyses of archaeological data, either how elements of *marae* objectified genealogies and gods as material symbols or how they reflected the territoriality of social groups as territorial markers. Instead his main concern was to explain — by comparisons of ceremonial structures — "the development and spread of Polynesian culture" (Emory 1970: 91). In this culture-historical perspective, morphological types were viewed as indicators of diffusion of cultural norms (cf. Hodder 1982a: 9).

1.1.2. Processual Perspective

In the 1960's, a different method of survey — settlement pattern archaeology — started to be applied to Polynesian prehistory. This included intensive coverage of a given area such as a valley or other defined locale, and excavations to reconstruct local cultural sequences. One of the earliest examples of such research was carried out in the 'Opunohu Valley of Mo'orea, Society Islands (Green 1961; Green et al. 1967). Green demonstrated that a range of *marae* types functioned contemporaneously in the society occupying the 'Opunohu Valley. He also pointed out that "the frequency of various *marae* types then becomes intelligible in terms of the social differentiation and stratification that had developed by the eighteenth century" (Green et al. 1967: 162). Thereafter, ceremonial architecture of East Polynesia has frequently been treated in studies aiming at the reconstruction of socio-political structures with a focus on the indices of architectural elaboration such as size, construction materials and a number of other elements.

Many archaeologists also ascribed the advent of large and elaborate structures to the late part of each chronological sequence by referring to the ethnohistorical accounts as well as to a limited number of radiocarbon dates (and sometimes as in volcanic glass dates) for their construction. They did so by considering architectural diversification and sophistication to reflect a process of socio-political integration which occurred in late prehistory (e.g.

Suggs 1961 in the Marquesas Islands; Kirch & Kelly 1975, Peebles & Kus 1977, Green 1980 in Hawaii Islands; Ayres 1973, McCoy 1976, Stevenson 1986 in Easter Island). There appears to have been a shared viewpoint which allowed these archaeologists to build a model of the evolutionary process of socio-political integration common to various islands. For this purpose, they synthesized a variety of data related to population growth, intensification of food production, environmental change and warfare (e.g. Kirch 1984) which in general followed a processual perspective that has been a main trend in Polynesian archaeology since the 1960's [1].

Recently, some archaeologists have proposed an 'evolutionary ecological model' which focuses more on ecological conditions in terms of the process of socio-political integration achieved in part through aggression (Graves & Sweeney 1993; Graves & Ladefoged 1995). The existing 'culture-evolutionary' model views inter-group aggression as a corollary of increasing social complexity or as a function of population increase and food scarcity. The new model, however, proposes that aggression is generated by groups living in comparatively less productive and less reliable locales even "when there are relatively stable and predictable food resources" (Graves & Sweeney 1993: 117). This model is based on the assumption that the cost for the increased production would be higher than that for aggression in such locales. Proponents of this model thus anticipate that ceremonial structures would exist unevenly in the less productive areas. Indeed, Ladefoged — on the basis of archaeological, environmental and ethnohistorical data — states that the Rotuman case strongly supports this model, and then turns to the cases of Maui and Hawai'i islands as also in keeping with it (Ladefoged 1993; Graves & Ladefoged 1995).

Some scholars also propose a 'selectionist model' to explain the process of appearance, proliferation and disappearance of ceremonial architecture. This model first assumes that 'superfluous activities' such as construction of ceremonial architecture would help to lower the birth rate and to constrain the population increase in a given area. On the basis of this assumption,

they propose that — in the locales vulnerable to unpredictable environmental perturbations — the people would invest their energy in superfluous behaviors to increase "survivorship of offspring through lower rates of population increase" (Graves & Sweeney 1993: 116; Graves & Ladefoged 1995: 161). In addition, they anticipate that — when the productive potential within a region changes — these behaviors may diminish in scale and frequency, "since they no longer enjoy a selective advantage" (Graves & Sweeney 1993: 119). While this approach may be of value as one of few processual frameworks focusing on ceremonial architecture itself, the model contains several unclear concepts and vague assumptions [2].

The processual perspective outlined above has contributed to an understanding of several characteristics of ceremonial architecture related to the varied socio-political organizations of Polynesia, and still maintains a great deal of influence at present (e.g. Kirch 1990). It would be, however, legitimate to state that in general most processual studies have not discussed ceremonial architecture itself. But many studies have referred to this conceptual framework as a means to or an important datum in understanding other phenomena, rather than simply an end in itself. Again, the processual approaches' main purpose is to reconstruct the process of socio-political evolution (Kirch 1984). Such approaches, for instance, discuss both grave mounds of high chiefs in Tongatapu and *heiau* in the Hawaii Islands in a rather similar way as evidence of a high degree of political stratification (e.g. Kirch 1990b).

1.1.3. Structural Perspective

It is not entirely accurate, however, to say that there are no studies aiming to interpret ceremonial architecture itself. For instance, Green & Green (1968) — relying on eyewitness descriptions and drawings recorded by Europeans as well as ethnohistorical information — indicated that several

archaeological types of *marae* in the Windward Society Islands were associated with or dedicated to the god, *Oro*. This study demonstrates that a variety of meanings can be encoded in various characteristics and patterns which archaeologists can observe in ceremonial structures.

A recent study on Easter Island emphasizes that "the *ahu/moai* complex symbolized — both architecturally and iconographically — the dominance of an ideology defined as male, lineage-based and incorporating anthropomorphic and bird symbolism" (Van Tilburg & Lee 1987: 134). The same author, then, suggests that temporal variations of *moai* reflect changes of ideology associated with socio-political hierarchy (see Graves & Sweeney 1993: 113). Kirch also focuses on stylistic variations existing between temple images of O'ahu and Kaua'i islands and on the western part of Hawai'i Island. He points out the likelihood that each of the regional variations would be invented purposefully by "a group of people in order to consciously distinguish themselves from the other" (Kirch 1990c: 50).

These studies, however, do not belong to that category of 'structuralist' approaches investigating 'high structures', that is ideal orders in mind or underlying orders such as up/down, left/right, inside/ outside or pure/impure (see Hodder 1982a: 7). They focus instead on structures or patterns consisting of similarities (e.g. functional similarities as *marae* or temple images) and differences (e.g. architectural or stylistic differences) in both spatial or temporal dimensions, and then try to interpret particular meanings encoded in such patterns. Therefore, it may not be entirely unwarranted to declare that these kinds of study are based on a structural perspective in the general sense or are, at the very least, incorporating basic structural elements.

As Kirch (1990c) notes, archaeologists in Polynesia have explored variations or differences — particularly in spatial dimension — observed in objects that otherwise at least share similar characteristics or functions. He restricts this tendency to its occurrence within the "normative" (1990c: 43) or

culture-historical approach, but his statement could apply equally to these processual studies which investigate general processes of socio-political hierarchy, even if it means breaking down societies into several categories as did Sahlins (1958) and Goldman (1970) [3].

On the contrary, the structural perspective turns more attention to local cultures, an emphasis which has been constrained in the processual approach. However, a structural perspective has the potential for revealing local meanings encoded in particular materials by analyzing local patterns of similarity and difference. Some results from this type of analysis may also provide convincing interpretations that then become available for processual studies which, for instance, view ceremonial architecture as playing "significant roles as visual symbols of chiefly hegemony and dominance" (Kirch 1990a: 217-8, see also more theoretical explanation in Earle 1991).

1.2. Theoretical Framework

Embracing the structural approach, I devote the first half of this thesis to interpreting meanings symbolized in patterns and characteristics which are archaeologically observed in the *marae* of Tongareva Atoll in the Northern Cook Islands. This aim derives from a simple question — what was/were the roles and significance of *marae* for the Tongarevan people. In the following section, I propose a theoretical framework for scrutinizing this issue. To begin with, it would be useful to examine the definition of 'symbol', since it is somewhat ambiguously used in archaeological studies of Polynesian prehistory.

1.2.1. Definition of 'Symbol'

The term 'symbol' can be used in several ways. In some cases it is associated with objects from which dichotomous distinctions are abstracted (Weisler & Kirch 1985: 154). In other cases, it is also applied to objects containing political ideology legitimizing chiefly hegemony and dominance (Kirch 1990a: 217-8). Still other scholars (Van Tilburg & Lee 1987) — quoting from the definition by Hodder — refer to it as "an object or situation in which a direct, primary or literal meaning also designates another indirect, secondary and figurative meaning" (Hodder 1982b: 11).

From the examples cited, it is evident there is little hope of achieving on a definition of 'symbol' which possesses any precision. However, I find it useful for purposes here to refer to Geertz's idea. He mentions the term may be "used for any object, act, event, quality, or relation which serves as a vehicle for a conception — the conception is the symbol's meaning," and that the term of 'symbolizing' can be defined as "concrete embodiments of ideas, attitudes, judgments, longings, beliefs" (Geertz 1973: 91). Given this definition, ceremonial architecture is a vehicle suitable for interpretive archaeology, since we can readily expect from it that the concept carries a set of particular meanings including those of a social, political, ideological, and religious order.

Several recent studies of ceremonial architecture, quoting from Hodder's elucidation (Hodder 1982b: 12), emphasize the active role of symbols in forming and giving meaning to social behavior (e.g. Descantes 1990: 4). Geertz also sets forth his view on this point, as the following:

> [Symbol has] two senses ··· an "of" sense and a "for" sense ··· and though these are but aspects of the same basic concept they are very much worth distinguishing for analytic purposes. In the first, what is stressed is the manipulation of symbol structures so as to bring them ··· into parallel with the pre-established nonsymbolic system ···. [In this sense, symbol] is a model *of* "reality." In the second, what is stressed is the manipulation of the non symbolic systems in terms of the

> relationships expressed in the symbolic [structures] ···. [In this sense, symbol] is a model *for* "reality." [Geertz 1973: 93 (underlining mine)]

In Geertz's framework, the active role of symbols is equivalent to the model (or template) "for" forming reality (or a system of social behavior). This role, however, is an aspect of symbols, which essentially couples it with other aspects. In other words, every symbol would have a role to play in forming reality on one hand, as well as reflecting reality on the other hand [4]. It is not my main purpose to investigate such a duality of the symbol in this thesis, but I will proceed mindful of the distinction.

1.2.2. Contextual Approach and Settlement Pattern Studies

Interpretation of meanings encoded in symbols is accompanied by two risks: interpreting more things than are really there and reducing particular meanings to a set of general explanations (e.g. Geertz 1980: 103). To overcome these risks, we must accumulate the "relevant contexts" by having at hand significant relationships among the objects at issue, along the lines discussed by Hodder (1986: 139).

Seen in this light, the processual approach in Polynesia has usually incorporated a variety of data, including not only archaeological but also ethnohistorical and ethnographic materials, so as to associate monumental architecture with chiefly hegemony and dominance or with a concept separating chiefs from commoners. This has proven advantageous for archaeology in Polynesia. Yet, before imposing convincing interpretations on various meanings embedded in ceremonial structures, there remains room to explore other contexts — including those of topographic features, vegetation types and views from sites — which are also relevant to the issues in question.

Tongarevan *marae* are a type of religious symbol. Thus, they should be

"richly polysemic" (see Geertz 1980: 105), and each *marae* may exhibit a different set of meanings. It is, however, impossible to holistically interpret all meanings [5]. This thesis therefore mainly focuses on characteristics related to the concept of 'cultural landscape.' That is, a product which has been formed by interaction between local culture and local environment, or by the human imposition of local meanings to a local environment. As such, we can view the construction of *marae* as a physical action of such an imposition. This concept allows us to invoke the issue of why a *marae* is provided with certain morphological characteristics at a particular locale. Data related to this issue include morphology of elements comprising a *marae*, configuration of these elements, its orientation, various features related to its location (for instance, topographic features, vegetation types, and prospects), and its spatial association with other architectural features. Through analyses of these data, it becomes possible to obtain patterns of similarity and difference.

The above characteristics may also be sorted by the method employed in settlement pattern studies. That methodology has established three levels of space (Clarke 1977: 11-15): (1) the micro level in which each dwelling house is treated as a spatial unit, (2) the semi-macro level in which a set of several dwelling houses and other archaeological features are viewed as a spatial unit, and (3) the macro level in which several sets identified at the second level are treated as a spatial unit. These levels have been developed to investigate prehistoric settlement patterns, but may be borrowed when discussing the 'cultural landscapes' of ceremonial structures. For instance, morphological characteristics of particular elements and their configuration within the confines of a structure are classified as belonging to the micro level. The location of a ceremonial structure could be analyzed at first within the confines of a spatial unit at the semi-macro level. In addition, we may be able to find yet other features by examining that location within the confines of a spatial unit set at the macro level.

In short, along with selecting characteristics for analyses, it is necessary

to establish spatial scales related to patterns of similarity and difference in order to clarify the spatial range in which each characteristic is observed (or not observed). Such spatial scales certainly vary relative to selected characteristics, and we do not have any absolute scale applicable to every region and every period. Thus, the spatial scale relevant to each characteristic must be picked out heuristically through trial and error (Hodder 1986: 135) or through the dialectical process of questions and answers (Hodder 1991: 11).

Archaeologists working in Polynesia, however, are fortunate in having ethnographic information which provides useful materials to help in establishing relevant scales. For example, it is possible in many cases to infer the spatial scale of social groups which constructed and used ceremonial structures by referring to such information. In the case of Tongareva Atoll in the Northern Cook Islands ethnographic accounts indicate that *marae* belonged to districts which are currently called *huaanga* (see Section 3.3). We can therefore establish three spatial scales for comparisons of *marae*: (1) the range of a district, (2) the range of several districts, and (3) the entire atoll.

Given this framework, it is possible to obtain two spatial dimensions. One is that of three spatial levels borrowed from settlement studies used to analyze various characteristics related to the landscape of ceremonial structures. The other is that of three spatial scales which are helpful to investigating patterns of similarity and difference in each characteristic. Their combination provides a set of relevant contexts within which to approach various meanings associated with the three social levels accepted in Polynesian archaeology: the household level, the community level and the political level (see Green 1984, 1993).

1.3. Research Design of Thesis

Following an introduction (this chapter) and one providing the general setting (Chapter 2), this thesis has three parts. The first is the case study of *marae* in Tongareva in the Northern Cook Islands (Chapter 3). The second is an additional case study of ceremonial structures in Rarotonga and Mangaia in the Southern Cook Islands. The last is a discussion concerning the overall diversity of ceremonial structures in the Cook Islands.

1.3.1. Introduction to Chapter 3

Until the middle of 19th century, the Tongarevans had settled in a dispersed fashion on habitable islets surrounding a vast lagoon. A historical document states that small households — generally consisting of less than 20 persons — were scattered on these islets (Lamont 1867: 116). The united assemblage of several households formed districts called *huaanga*, each of which was controlled by a chief *(ariki)*. More than ten districts existed before European contact (Campbell 1985: 64, see also Section 3.3.1). On the basis of historical documents and ethnographic accounts, three social levels can be established: household units, districts and inter-district assemblages. The following is a summary of main issues related to each of these levels.

<Household Level>

In the mid 19th century there were two kinds of household units. The first was of small units of less than 20 persons. Another was of more thickly settled units which appear to have been residences of district chiefs. A historical document describes that a *marae* was located about 15 minutes from a thickly settled portion (Lamont 1867: 120). This account suggests there was a symbolic ordering of space within the confines of household units. In Section 3.2, this issue is examined from the spatial association between *marae* and household units.

<District Level (Community level)>

Tongarevan *marae* are supposed to be distributed as visible markers which express territoriality or tenure of districts and access to particular resources. Section 3.3 sets out the various topographic features surrounding *marae* in order to address this issue. It does so by reconstructing district territories on the basis of ethnographic accounts and an old map.

<Inter-District Level (Political Level)>

Oral traditions state that districts occasionally formed political alliances for mutual protection or aggression. This ethnographic information suggests the possibility that Tongarevan *marae* also reflect socio-political relations and that cosmological concepts were shared among several districts. I approach this issue by exploring comparisons among characteristics of *marae*, in particular their common morphological elements and *marae* direction.

1.3.2. Introduction to Chapter 4

Chapter 4 considers Cook Island ceremonial structures in Rarotonga and Mangaia in the Southern Cook Islands. The aim is to demonstrate how the variety of meanings differ relative to each island and context. I do not, however, have sufficient contextual information to interpret the many meanings encoded in the ceremonial structures of these two islands to the same degree as that achievable for the Tongarevan case. Thus, only certain specific issues are discussed in relation to each of these two islands.

Case Study of Rarotonga: Rarotongan ceremonial structures — in particular, *marae* — exhibit remarkable diversity both in collective configuration and location. I discuss the association of this diversity in relation to the prehistoric socio-political system, in this case consisting of *tapere* (basic land divisions occupied by lineages) and *vaka* (territorial tribes). The result illustrates that one important role of Rarotongan *marae* is associated with

various sacred or ceremonial spaces within each *tapere*, while other ceremonial structures such as T-shaped *paepae* and *koutu* served as political nodes at the *vaka* level.

Case study of Mangaia: In marked contrast to those in Rarotonga, Mangaian *marae* are homogeneous both in collective configuration and location. In Section 4.2, I investigate an aspect of this homogeneity by associating it with the well-institutionalized political system covering the entire island and the irrigation system.

1.3.3. Introduction to Chapter 5

In the Chapter 5, I further explore the morphological diversity of ceremonial structures in the Cook Islands by referring in turn to those in other islands: Manihiki, Rakahanga and Pukapuka in the northern group, and Aitutaki, Atiu, Mauke and Mitiaro in the southern group. This allows one to foreground the limitations of a culture-historical approach to the study of *marae* in the Cook Islands. It also sets the stage for examining the theoretical implications of the various case studies to future research of ceremonial structures in Eastern Polynesia including the Cook Islands.

1.4. Summary of Introduction

This thesis aims to interpret various meanings encoded in ceremonial structures of the Cook Islands. For this purpose, I try to illustrate what is gained by focusing, in particular, upon the diversity or the heterogeneity exhibited by these ceremonial structures rather than by reducing them to any general sets of types within East Polynesia. This frees the concept of *marae* from reductionism and from various stereotypes of East Polynesian '*marae*'. The aim and the method therefore contrasts with a processual

approach that attempts to build very general models through synthesizing classifications of these structures. Instead by contextualising them within their cultural landscape, I hope to show that additional aspects of their meaning can be obtained.

Notes to Chapter 1

(p. 5) [1] The processual approach in Polynesia, of course, is related to New Archaeology that is common among North American archaeologists. However, it has also been drawn from an evolutionary perspective which Sahlins and Goldman developed (see Graves & Sweeney 1993).

(p. 6) [2] It appears that this model includes some unclear concepts. First, the model must demonstrate the causal relation between superfluous activities and lower birth rate through concrete cases in East Polynesia. Second, while authors distinguishing unpredictable perturbations from predictable ones, this distinction would not be evident in the explanation of locales which they used as supporting the model. In addition, even if these locales are vulnerable to unpredictable perturbations, these would not support the model until the level of social groups — which constructed and used each ceremonial structure — becomes clear. For instance, in the case of islands of Tahiti and Mo'orea, it would be plausible to the same degree that each small group (such as a lineage, which explored the inland separately) constructed *marae* on a limited area within valley topography. The last is related to epistemology. In other words, this model is susceptible to discussions as to whether the people perceive the necessity of population control, predicting the unpredictable perturbations. Therefore, in attempting to extract this information, we should carefully collect the ethnohistorical accounts associated with natural hazards on each locale or island.

(p. 8) [3] Recent processual studies surely admit the importance of regional differences. For instance, Earle states that the studies of chiefdom should evaluate the differences as well as similarities "in societal change from region to region" (Earle 1991: 4), and this view may lead to a provocative suggestion "that the three components of power (i.e. control over the economy, war, and ideology) ··· present alternative strategies" (Earle 1991: 9) for the creation and maintenance of regional polities. In general, however, the common processes tend to be stressed in the conclusions of specific comparative-studies in Polynesia (e.g. Kirch 1990a).

(p. 10) [4] In a discussion of settlement pattern archaeology, Green (1970: 13) also pointed out both aspects of settlement pattern: "pattern of behavior" and "pattern for behavior." But, he considered that the former belonged to the technological, economic, social, political, and religious activity systems, and that the latter belonged to the ideological structure which might form such activities. He probably viewed the former as infra-structure, and the latter as super-structure. In this point his view differs form that of Geertz.

(p. 11) [5] We can find a similar problem in employing a holistic perspective in cultural anthropology. For instance, Peacock states that "Holism is an important but impossible ideal". We can not "think everything," and therefore we have to categorize the object into some aspects "depending on the task or question at issue" (Peacock 1986: 19).

Chapter 2

General Settings for Settlement in Tongareva and Other Atolls of the Northern Cook Islands

The Cook Group comprises fifteen islands spread over a large area of 2 million sq. km. in Central Polynesia (Fig. 2.1.1). These islands fall geographically into two clusters, the Southern and the Northern Cooks. The islands in the southern group, which lie around 20 degrees south latitude except for two islands, are generally of volcanic origin with fertile soil. In contrast, all the islands in the northern group — strung out along 10 degrees south latitude — are coral atolls with the exception of a sand cay on a coral reef base (Nassau).

Keio University researchers have undertaken repeated archaeological surveys in the Cook Islands since 1985, and the total period involved has reached more than a year's duration. The first phase in 1985 concentrated on Pukapuka Atoll in the northern group and Mangaia Island in the southern group. In the second phase, from 1989 to 1991, the focus turned to other islands in the northern group in order to better procure further information on atoll prehistory in that part of Central Polynesia. We surveyed three atolls: Tongareva, Manihiki and Rakahanga. In this phase, we also excavated several sites in Rarotonga, a volcanic island in the southern group, in order to amass archaeological information comparable to that from the northern atolls. The third phase started in 1995 and is currently still in process. We surveyed Pukapuka again in 1995, and Rarotonga in 1996. I also had a chance in 1995 to excavate several ceremonial sites in Tongareva, an atoll in the northern group.

The discussion in this thesis is based mainly on extensive data from these surveys. Following the research design outlined in the preceding

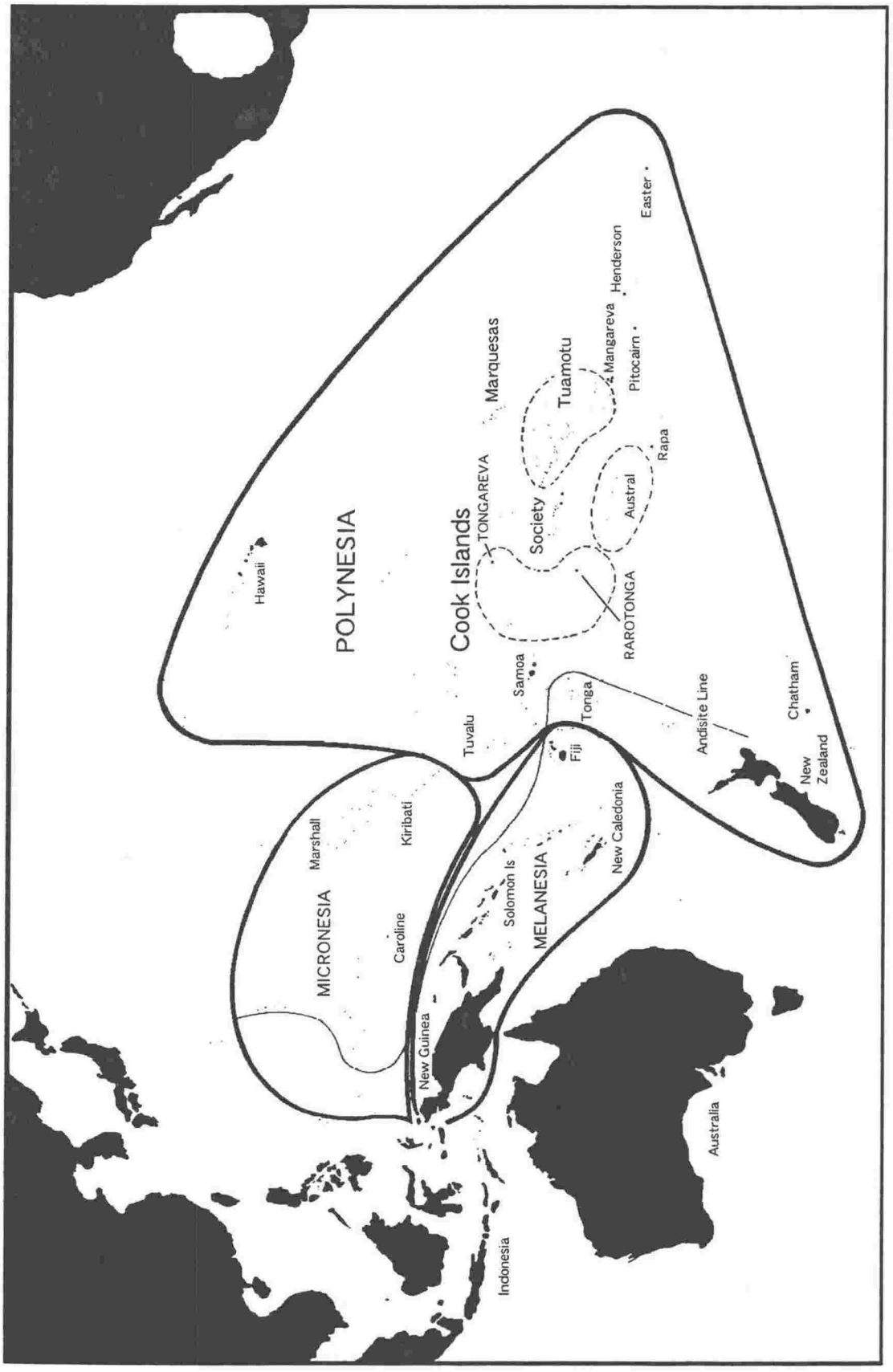

Fig. 2.1.1. Location of the Cook Islands

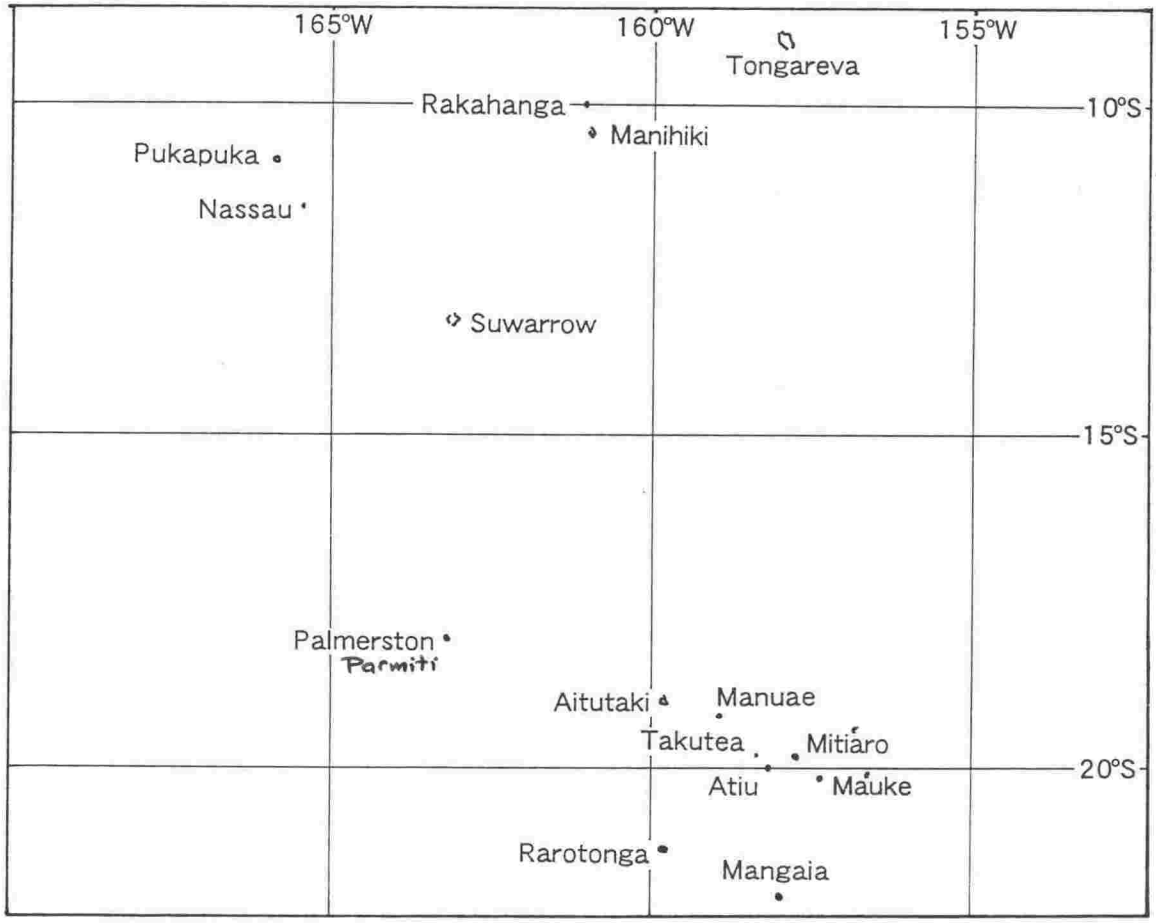

Fig. 2.1.2. Map of the Cook Islands

chapter, I will explore various meanings encoded in Tongarevan *marae*. Then I will turn the focus to ceremonial structures reported on other islands in the Cook Islands with a similar aim. Thus, the data from other islands provide further insights into understanding the Tongarevan *marae*. Before exploring the ceremonial structures themselves, however, it would be useful to provide background on their physical setting, including the formative processes of their atoll environment and aspects of the history of human colonization in the Northern Cook Islands.

2.1. Physical Setting of Tongareva Atoll

Tongareva (Penrhyn) Atoll lies at the northeastern margin of the Cook Islands (9 degrees south latitude and 158 degrees west longitude). The Line Islands extend to the north of the island, and the Society and the Tuamotu Islands lie to the southeast (Fig. 2.1.1). One can reach the atoll in 4 or 5 hours on a twin-engine plane from Rarotonga Island which is the administrative and economic center of the Cook Islands.

2.1.1. Geomorphology

Tongareva comprises a continuous coral reef with narrow, elongated islets (*motu*) of coral sand and gravels appearing along the reef margin. The islets are separated by passages or channels linking the lagoon with the ocean. The lagoon includes an extensive area of about 22 by 14 km (280 km^2) and is studded with patches of coralline reef. The islets lie on bedrock of aragonite reefal deposits, as was observed at the bottom of some of our excavated trenches (Yamaguchi 1995: 75). This bedrock rises from water depths in excess of 5 km. Coral growth, which commenced from the original fringing reef around a subsiding volcano, began in the mid-Miocene (Wood & Hay 1970).

Subaerial landforms on atolls are markedly simpler than those of volcanic islands. As seen in Fig. 2.1.3, however, several micro-topographic features are discernible. These features prove to be spatially associated with ceremonial structures (see Section 3.4). In the tidal zone of the ocean side, cemented beach-deposits — so-called beachrock — occur (cf. Emery 1953: 19; Wiens 1962: 64-7). This formation is cross-bedded along the beach slope, and coral slabs can be easily quarried from it. The people used such slabs for building architectural features including *marae*. Similar deposits of coral limestone are observed on some parts of lagoon-side shoreline (Yamaguchi 1995: 77).

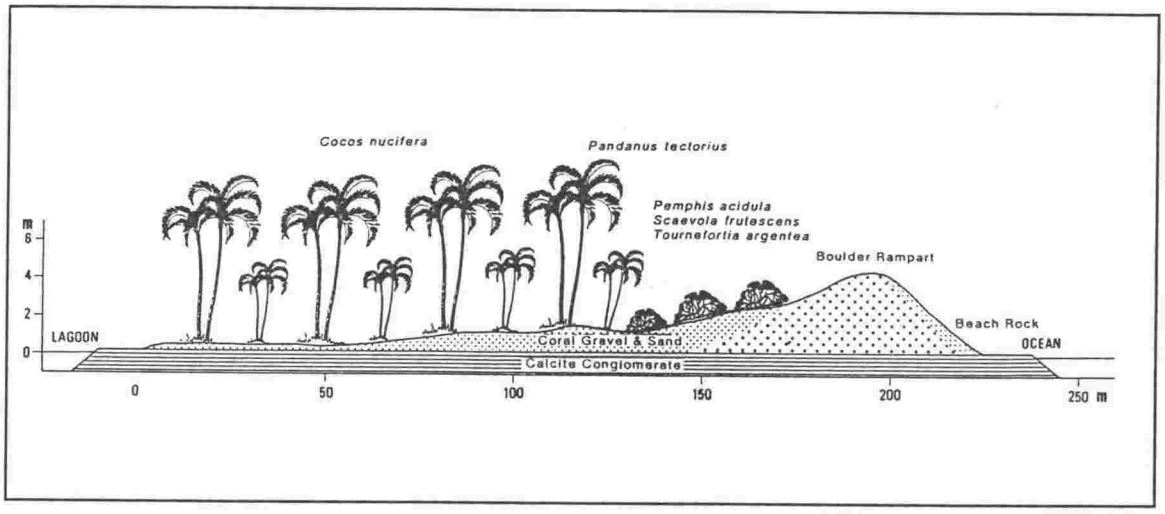

Fig. 2.1.3. Schematic cross-section of Tongarevan islets

The subaerial landform and the vegetation of atolls are considerably simpler than those of volcanic islands, but some distributional variations of micro-topographic features and timber trees are discernible.

There is a mass of coarse debris along the ocean shore — boulder rampart or storm ridge — which lies up to 4 m above sea level in places. Ridges formed of coral gravel and boulders are usually washed over and accumulate on the already existing land through cyclonic wave and surge effects (Chappell 1982: 74). An inland flat extends from the rampart to the lagoon beach. Coral gravel is found beneath the humic soil, with reducing grain size towards the lagoon (cf. Wiens 1962: 333; Chikamori 1995: Fig. 4).

Large islets feature brackish or freshwater inlets which are usually related to the lagoon-side accretion of beach deposits. The lagoon shores of younger islets were originally crenulated. The intricate indentations of such a shoreline — sometimes called *barachois* — are caused by sediments washed over the islet that fan out along its lagoon shore. These gradually become infilled (Nunn 1994: 284). When the lagoon side of the indentation is completely closed by sandy spits, it becomes an inlet. The enclosed water will gradually change from a saline through brackish to a freshwater pond as more rainwater is stored there. The people traditionally used such saline or brackish inlets for the aquaculture of milkfish (*Chanos chanos*) called *ava* in the local language. Some of the inlets overtime are influenced by continual

accretion of sediment supplied from the surrounding land, and consequently become infilled with sand and mud. In such wet lands, the people have cultivated a type of *taro*-like tuber plant called *puraka* (*Cyrtosperma chamissonis*).

2.1.2. Vegetation

While the least modified communities of plants on atolls rarely have more than about 15 species, this vegetation contributes to the formation of the atoll's landscape (cf. Spencer et al. 1994: 31-2). Coconut trees (*Cocos nucifera*) account for about 90 percent of total vegetation (Linton 1933). The dense and often uniform forests of this species extend throughout the length and breadth of many islets.

Where the forest is a little more open, *Pandanus tectorius* (*hara*) is often common and *Morinda citrifolia* (*nonu*) is usually present as a subcanopy species. One can observe the more marked, spatial shift of vegetation at the margins of islets, especially those on the ocean side (Fig. 2.1.3). Such areas are usually covered with small trees and shrubs such as *Pandanus tectorius*, *Scaevola taccada* (*ngasu*), *Pemphis acidula* (*ngangie*), *Tournefortia argentea* (*tausunu*), and occasionally with *Cordia subcordata* (*tou*) and *Guettarda speciosa* (*hano*). Such open vegetation is also predominant on smaller islets where the surface is generally covered with coral rubble or compacted coral.

2.1.3. Freshwater

No surface freshwater occurs on the atolls, so only groundwater was available to the people. While the extent of groundwater has not yet been surveyed in Tongareva, it should be analogous to other atolls where this has been determined. The calcareous bedrock is so porous that it functions as an aquifer. Seawater infiltrates into this formation, but rainfall percolating

from the surface forms a Gyben-Herzberg freshwater lens on the saline water. The recent survey on Majuro Atoll of the Marshall Islands revealed that the freshwater lens was thickest near the lagoon (Griggs & Peterson 1989: Fig. 10). This is because the bedrock is fine-grained there, impeding freshwater flow into the lagoon (Newhouse 1980: 8). Most settlement sites in Tongareva lie close to the lagoon shore (Bellwood 1978: 179-87). In part this may be related to the thickness of the freshwater lens; other reasons may be cultural or relate to security of settlement and exploitation of the marine resources of the lagoon.

2.2 Atoll Formation in the Northern Cook Islands

The subaerial landform of most atolls — except reef islands affected by local tectonic movements — has formed in the geologically recent period of the last 6000 years. Before that time, the sea level was rising rapidly in association with eustatic movement, but since then it has shown more stability at a position around its present level. Corals have also grown upward and formed broad reef flats close to low-tide sea level [1]. During the phase of rapid rise of sea level, however, the Holocene reef growth would have been in geomorphic disequilibrium, since the rate of growth lagged behind that of sea level change. Such a time lag can often be inferred from the fact that coastal sedimentation on an atoll is frequently found to have commenced later in time — some times by a few thousand years — than the sea level change (Chappell 1982: 72-3). This model — the so-called 'catch-up' strategy of reef growth (Neumann & Macintyre 1985) — alerts us to the fact that we must consider the formation processes of atolls in scrutinizing the early phase of human settlements on them in Central Polynesia. In discussing the formation process, it would be useful to distinguish two factors: sea level rise associated with biogenic accretion of the coral reef and the sedimentary progradation of subaerial landform. I cover each of these factors in the following sections.

2.2.1. Sea Level Change and Emergence of Holocene Corals in the Northern Cook Islands

The Holocene sea level rise has been a moot point, and positions of scholars tend to fall into two basic schools of thought (Clark 1990). One camp has held that there were times during Holocene in one region of the Pacific when the sea stood higher than the present level (e.g. Dickinson and Green 1998). Most models in this camp suggest a rise above present level by less than a meter to several meters in magnitude, and place the maximum of this rise between 4000 and 2000 yr. BP. The second school argues that the present sea level is the same as the highest point reached in the Holocene period [2]. However, it has recently become evident that a global sea-level curve would not be possible, and that the pattern of the Holocene sea-level change has varied relative to different points on the earth. Thus, the focus of attention has shifted to local and regional studies of sea level [3].

Lithified reefal deposits at positions above mean sea level have been widely reported from throughout the Indo-Pacific reef province, and the islands of the South Pacific would be placed into a single broad region in which the maximum elevation of the sea level reached a higher position in the mid Holocene than the present level [4]. Evidence recorded from eighteen atolls in the Tuamotu Archipelago, in particular, supports this interpretation. The maximum elevation reached a position of approximately 0.9 m above the present sea level about 5200 yr. BP, at least in the northwestern Tuamotu, or of 0.8 to 1.0 m above the present level about 4500 yr. BP in southeastern Tuamotu (Pirazzoli & Montaggioni 1986; Pirazzoli et al. 1988).

The atoll of Suwarrow in the Cook Islands has also provided evidence consistent with that from Tuamotu (Woodroffe et al. 1990). Thus, it has extensive outcrops of emergent reef. Their upper surface is at 50 cm above the present low point in sea level. Such units yielded radiocarbon dates ranging from 4680 to 4310 yr. BP. In respect of the timing of Holocene coral emergence, however, the records from the Cook Islands differ from that identified in the

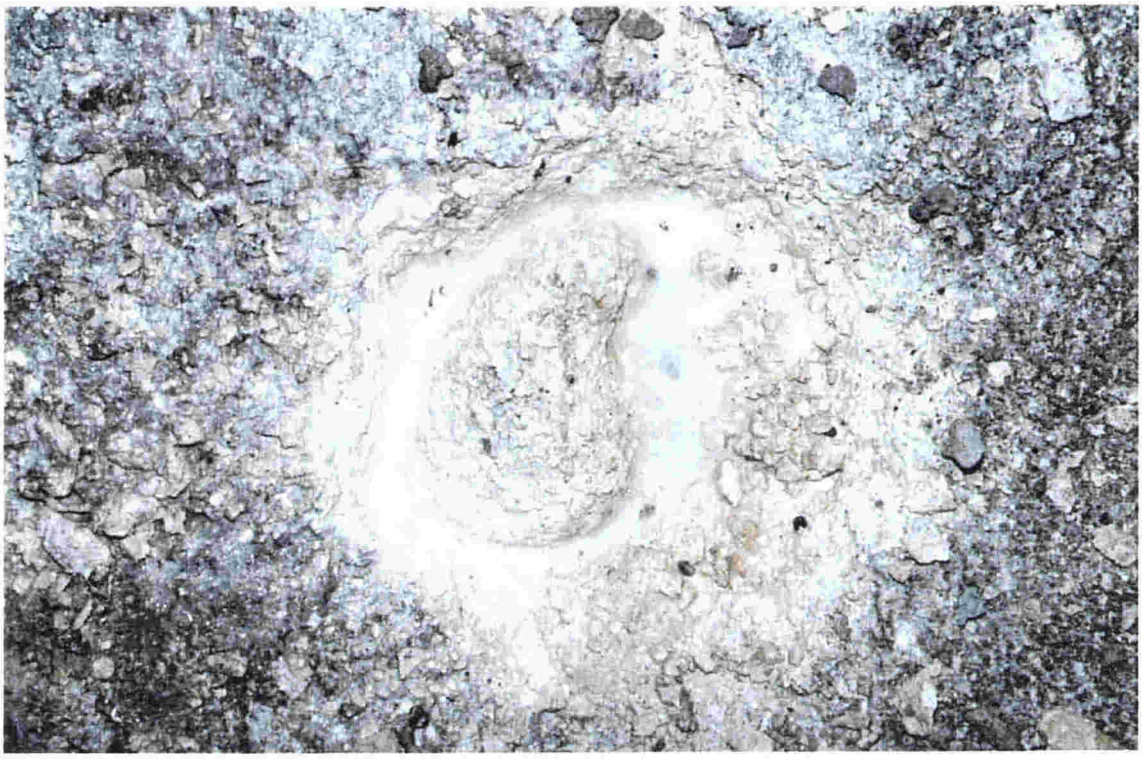

Fig. 2.2.1. Calcite bedrock exposed at the bottom of excavated trench

Photo in Pukapuka. Similar bedrock was found in other three atolls of the Northern Cook Islands. It was so consolidated that the piece was cut out by a pickax.

Tuamotu Archipelago. Emergent Holocene features in the Cook Islands can be dated to a range of 5100 -3400 yr. BP [5]. In contrast, the records from the Tuamotu Islands indicate that a gradual sea-level drop started only after 1500 yr. BP (Woodroffe et al. 1990: 37; Pirazzoli et al. 1988: 67).

On this point, data collected from four atolls — Tongareva, Manihiki, Rakahanga and Pukapuka — in the Northern Cook Islands are intriguing (Table 2.1.1). The flat and horizontal surface of aragonite bedrock was exposed at the bottom of excavated trenches in every atoll. It was so lithified or consolidated that the pieces had to be cut out with a pickax (Fig. 2.2.1). Thus, such bedrock should constitute the trace of an old reef flat formed in the past, and material from it give an indication of its age.

We measured the vertical position of each of these bedrock samples on four atolls with a telescopic level from the approximate mean sea level (MSL) on the adjacent lagoon shore, and found that the surface of bedrock occurred above the present MSL in each atoll: +48 cm in Tongareva, +8 cm in Manihiki, +38 cm and +15 cm in Rakahanga, and +14 cm in Pukapuka (Table 2.2.1) [6].

The depth down to volcanic bedrock on which reef growth took place would have affected the formation and altitude of the subsequent coral reef flat. In addition, because hermatypic coral grows upwards to the low-tide sea level and then expands horizontally, the measurement of altitude at a particular position on the coral bedrock is essentially rather delicate. However, it seems reasonable from our measurements in four atolls that the low-tide level —the altitudinal limit of hermatypic coral growth —in the Northern Cook Islands formerly stood higher than the present level, and this result is consistent with the evidence from other islands in Central Polynesia.

Of special interest is the fact that there are variations in radiocarbon dates obtained from aragonite bedrock in the Northern Cook Islands (Table 2.2.1). The date from easternmost Tongareva constitutes the latest date — 1866 - 1686 cal. yr. BP (N-5654) — which is equivalent to dates from islands of Tuamotu [7]. On the other hand, the sample from westernmost Pukapuka yielded the earliest date at 5270 - 5031 cal. yr. BP (WK-4525), while the sample from Manihiki — located between the above two atolls — was dated at 4325 - 4073 cal. yr. BP (N-6152). Although we did not retrieve any bedrock samples from Rakahanga, not far from Manihiki, one of the Tridacna shells from a sandy layer — naturally accumulated just above the bedrock — gave a date at 3175 - 2914 cal. yr. BP (N-5884). This suggests that the Rakahangan reef emerged above the MSL before that period, a timing which would be equivalent to that in Manihiki.

The data from the Northern Cook Islands illustrate that the emergence of Holocene corals was later from the west toward the east. This trend is

Table 2.2.1. Radiocarbon dates on emergent Holocene corals and early human-settlements in the Northern Cook Islands[1]

Atoll	Lab no.	Site code	Material	description	^{14}C y BP [2]	Cal. y BP [3]		Altitude (cm) [4]
						Range (1 Σ)	Mean	
Tongareva	WK-4091	TON-21	charcoal	early settlement	470 ± 130	623 - 323	473.0	+83
	N-5592	TON-40	charcoal	early settlement	460 ± 75	538 - 470	504.0	+88
	ANU-10217	TON-47	turtle plastron	early settlement	960 ± 60	548 - 475	511.5	+106
	WK-4094	TON-47	charcoal	early settlement	560 ± 50	629 - 523	576.0	+101
	NUTA-2086	TON-36	human bone	early settlement	700 ± 160	913 - 567	740.0	+124
	N-5654	TON-40	bed rock	aragonite	1790 ± 75	1866 - 1686	1776.0	+48
Manihiki	N-6151	MNH-07	charcoal	early settlement	580 ± 80	648 - 519	583.5	+78
	N-6663	MNH-07	charcoal	early settlement	590 ± 110	657 - 514	585.5	+84
	N-6143	MNH-07	charcoal	early settlement	600 ± 90	655 - 524	589.5	+44
	N-6150	MNH-07	charcoal	early settlement	640 ± 85	663 - 543	603.0	+90
	N-5863	MNH-07	charcoal	early settlement	730 ± 75	703 - 646	674.5	+95
	N-6152	MNH-07	bed rock	aragonite	3740 ± 80	4325 - 4073	4199.0	+8
Rakahanga	N-5877	RAK-Tek-B	charcoal	early settlement	560 ± 100	648 - 509	578.5	+196
	N-5873	RAK-Tek-B	charcoal	early settlement	620 ± 95	661 - 532	596.5	+152
	N-5876	RAK-Tek-B	charcoal	early settlement	670 ± 140	708 - 534	621.0	+164
	N-5875	RAK-Tek-B	charcoal	early settlement	880 ± 120	928 - 670	799.0	+96
	N-5874	RAK-Tek-B	charcoal	early settlement	1060 ± 85	1058 - 920	989.0	+92
	N-5886	RAK-Tek-B	Tridacna	natural layer	1940 ± 75	2039 - 1848	1943.5	+62
	N-5884	RAK-Tek-B	Tridacna	natural layer	2840 ± 85	3175 - 2914	3044.5	+62
		RAK-Tek-B	bed rock	aragonite	not dated			+38
		RAK-Tek-D	bed rock	aragonite	not dated			+15
Pukapuka	WK-5088	PUK-W11	charcoal	early settlement	650 ± 50	658 - 554	606.0	+182
	N-5106	PUK-W5	charcoal	early settlement	1490 ± 65	1411 - 1306	1358.5	+96
	N-5107	PUK-W6	charcoal	early settlement	1800 ± 75	1818 - 1612	1715.0	+102
	WK-4524	PUK-W9	Tridacna	early settlement?	2590 ± 50	2296 - 2120	2208.0	+229
	N-5101	PUK-W1	Tridacna	early settlement?	2240 ± 60	2353 - 2267	2310.0	+120
	WK-4525	PUK-W12	bed rock	aragonite	4910 ± 60	5270 - 5031	5150.5	+14

(1) The detail of each sample is provided in Appendix 2.

(2) Conventional ^{14}C dates are based on half-life of 5568 years, and applied with correction for isotopic fractionation, apart from samples having the lab-code "N".

(3) Calibrated ages were calculated with the CALIB 3.0 (Stuiver & Reimer 1993). Samples originating from marine environment were calibrated with the ΔR (45.0 ± 30.0) obtained from the South Pacific (Stuiver et al. 1986; Stuiver & Braziunas 1993), and marine samples having the code "N" were, in addition, calibrated with ∂13 values obtained from other samples having the code "WK". The NUTA-2086 was also calibrated with an approximate ∂13 value for bone collagen (Bowman 1990).

(4) The altitude of each sample location was measured from the approximate mean sea level taken at the adjacent lagoon shore.

consistent with records from Tuamotu Archipelago (showing the age of 1500 yr. BP) [8], although it is currently not evident what factor was associated with this trend [9]. We must, however, take the difference of timing into account, since it would affect subsequent formation of the subaerial landforms on which early human-settlement in each atoll could then be established.

2.2.2. Sedimentary Progradation

On atolls, once broad reef flats were formed close to the mean low tide level, sedimentation of sand and shingle on this platform base would have started. This second factor related to atoll formation may therefore be treated as a type of progradation, the progressive formation of new land by sedimentation. The process of progradation as a formative method of producing subaerial landform can be explained through four stages described below (see also Nunn 1994: 244-9).

Stage 1. Cay made of sand and shingle accumulated on broad reef flats tends to be common yet ephemeral and transient features of oceanic reefs. Powerful storms may cause cay distribution on a particular reef to be rapidly and radically altered.

Stage 2. The development of beachrock along the ocean-facing shorelines of cays marks a critical stage in their development. Beachrock will develop only when the accumulation of the detritus which comprises a cay becomes sufficiently large, which itself implies a degree of permanency. Once beachrock commences forming, it will act as protective cover around the cay or at least along its most vulnerable coasts.

Stage 3. The principal factor by which islets are distinguished from cays is the occurrence of storm ridge or rampart in the fabric of the former which gives them a greater degree of permanence than most cays. Ridges are usually restricted to the windward sides of atolls. In areas where tropical storms are less frequently experienced, islets may grow as the result of sediment being repeatedly washed over the reef flat.

Stage 4. Once islets are established, they usually become stabilized further through the colonization of vegetation. Initial colonizers such as *Pemphis accidula* stabilize unconsolidated materials through root binding and the accumulation of humus leading to soil formation. Shoreline vegetation colonization serves to trap sediment and inhibit its longshore movement.

Various forces of local terrestrial dynamics can advance the process of progradation, but the wave abrasion of reefs produces most of the sediment found on atolls (Chappel 1982: 72). In particular, where waves obliquely approach a shoreline, the effect of wave reflection occurs and the distribution of wave energy is altered. This wave energy is focused at convex points of the reef flat, especially on its ocean side (cf. Nagata 1990: 113). Thus, the sediment budget or rate of progradation varies relative to individual islets but is dependent on the horizontal shape of reef flat where the various islets lie. In support of this, there are broader and higher islets in Pukapuka with its angular reef flats than in Tongareva which has comparatively smooth reef flats.

The shingle abraded from coral reefs is transported to its onshore position mainly by wind waves and cyclonic waves. All atolls in the Northern Cook Islands lie in the southern belt of the east trade winds. From this viewpoint, islets — in particular on the eastern sides of atolls — would be constantly supplied to varying degrees with sediment. In addition, these atolls lie to the east and the north of the South Pacific Convergence Zone (SPCZ) where troughs associated with low pressure systems occasionally develop. The development of troughs is accompanied by an increase in the width of the cloud band and a deterioration in the weather. Cyclonic waves and surges with great energy — produced by strong westerly winds of such troughs — wash the western shores of atolls and therefore supply a large amount of sediment to that part of the islet.

As described above, the formation process of a subaerial atoll landform in the Northern Cooks is strongly associated with meteorological phenomena. To see if this is true, we must examine the meteorological condition of each atoll, as the effect of troughs producing energetic waves varies among them. Pukapuka is closest to the SPCZ and would experience stronger wind and waves than Tongareva farthest from the Zone. Such variations are, while somewhat indirect, illustrated as well by the mean annual rainfall distribution in the Northern Cook Islands. The diagram in Fig. 2.2.2

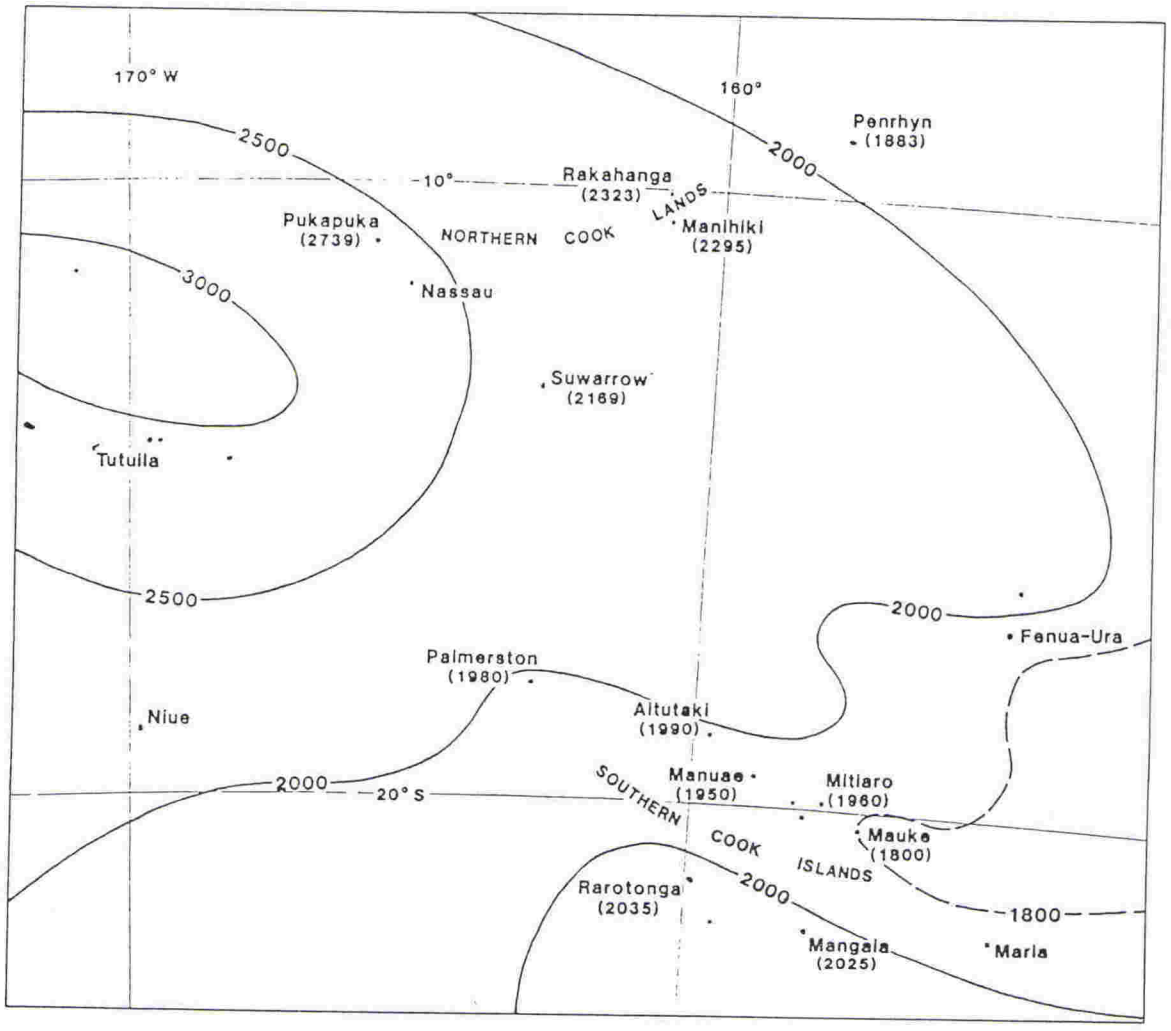

Fig. 2.2.2. Mean annual rainfall distribution for Cook Islands 1951-1980

Adapted from Thompson 1986: Fig. 9 (p. 18). The diagram shows that Tongareva (Penrhyn), on the edge of the South Pacific very dry Zone. Rainfall amounts increase from Tongareva to Pukapuka which lies in the region of influence of the SPCZ. The rainfall distribution suggests that the effect of troughs producing energetic waves varies among atolls in the Northern Cook Islands.

indicates that the annual rainfall decreases from Pukapuka to Tongareva (Thompson 1986: 18). Pukapuka therefore is more affected by troughs, and these provide better conditions for islet formation.

2.3. Colonization of the Northern Cook Islands

The orthodox scenario of Polynesian colonization which prevailed towards the end of the 1970s included in it a model for a 'Long Pause,' a lag in colonization of East Polynesia from West Polynesia. Thus, it was held that there was a gap of 1500 years between the settlement of West and East Polynesia, and that Ancestral Polynesian Society developed in West Polynesia in the early part of the period before the pause. Archaeologists have estimated this time gap from the difference in radiocarbon dates between the early settlements of West Polynesia (1100 BC from Tonga and 1000 BC from Samoa) and the Marquesas (AD 300).

Recently, however, some archaeologists have questioned the 'Long Pause' model (e.g. Bellwood 1970: 96; Davidson 1976: 46; Irwin 1981, 1998; Kirch 1986). The persuasive and simplest reason is that the model is inconsistent with the colonization pattern of Lapita communities whose spread in Oceania occurred so rapidly (Irwin 1981, 1992: 70-3). Their previous success in colonizing voyages would have been sufficient to enable them to extend their colonization further to the east of Tonga and Samoa. In this continuous model of colonization, the Cook Islands — located between Samoa and the Society Islands — is envisioned as one of most plausible candidates for settlement, and would document an earlier colonization period than previously thought (e.g. Kirch 1986: 33; Kirch & Hunt 1988: 17).

From the perspective of the continuous model, there is a possibility that we would eventually discover several settlement sites in the Cook Islands which are dated some centuries earlier than those of the Marquesas group but a few centuries later than those of West Polynesia. In a map showing bands of colonization periods expected from island positions and available radiocarbon dates, Irwin suggests that the Cook Islands was settled during the first millennium BC (Irwin 1992: 80).

While the earliest archaeological evidence from the Southern Cook

Islands is currently confined to the period AD 800 – 1200 (see Walter 1994: 224, 1998), carefully-handled evidence both from pollen analysis and geochemical analysis indicates that forest disturbance had been induced in Mangaia probably by human impact as early as at least 2000 – 1600 BP (Kirch and Ellison 1994). They also suggest that thick alluvial clays cover undiscovered early habitation sites (Kirch & Ellison 1994: 317). This suggestion is supported by our own observation in Rarotonga. A test excavation at the valley mouth of Avana River revealed the huge amount of accumulation of alluvial deposit reaching 6 meters in thickness (Chikamori per. comm.) [10]. Beneath such thick deposit, therefore, there is the possibility that early habitation sites will be found in future in Rarotonga. However, it is not sure whether or not such sites there have been dated, currently 1030±50 BP (Beta-118204) is the earliest Rarotongan date from site RAR-12 in Motu Tapu (Okajima in preparation; see also Appendix 2), It is as early as that of Kirch and Ellison's discussion of habitation events in the Mangaian sequence. We thus need to wait for further archaeological materials from excavation before conclusion about either Rarotonga and Mangaia.

In respect of the Northern Cook Islands, which is closer to West Polynesia than the southern group, there is a different question about when the atolls became available for human settlement. As Irwin (1992: 84) suggests, it would have taken growing coral some time to catch up with the rising sea level in Holocene, and still longer before calcareous sediment produced by wave abrasion formed islets on the reef available to be colonized first by plants and birds and then by humans. However, making this claim does not necessarily preclude the possibility of finding earlier settlements there which date back to the late first millennium BC or the early first millennium AD, since the timing of Holocene coral emergence and in growth speed of subaerial landform is expected to vary among those atolls (see Section 2.2.2).

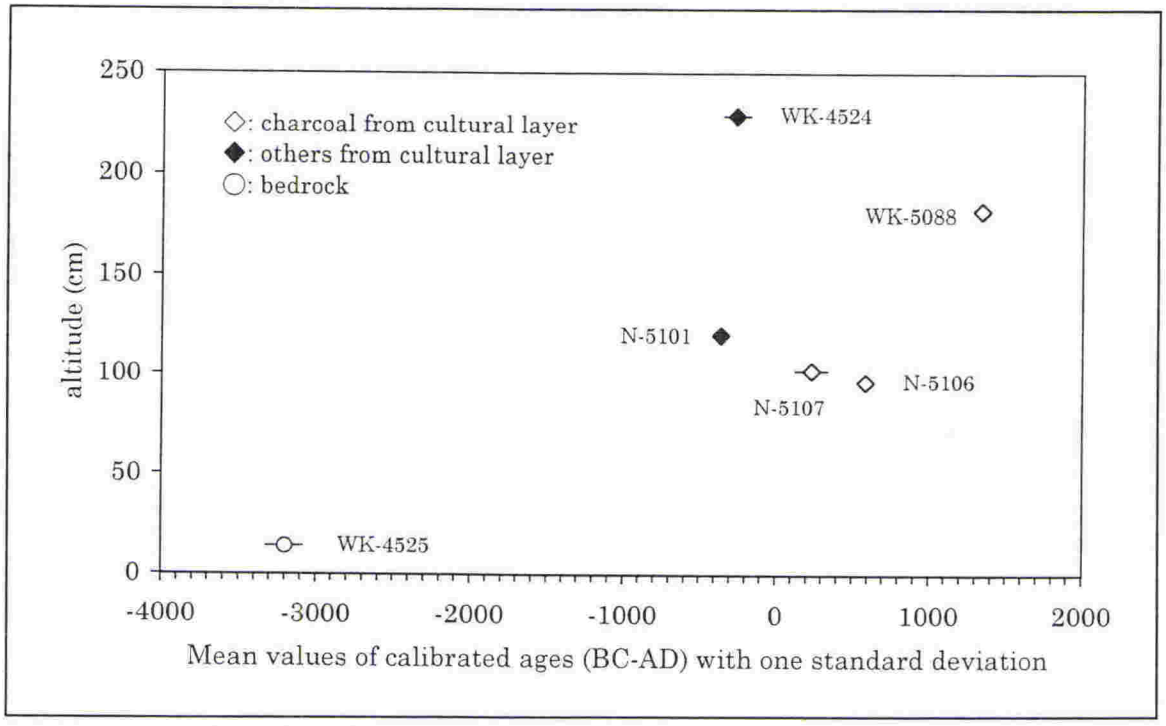

Fig. 2.3.1. Radiocarbon dates associated with atoll formation and early settlement of Pukapuka

In the Northern Cook Islands, Pukapuka is the atoll provided with the best conditions for its islets to grow rapidly. From this viewpoint, there is the possibility that Pukapuka would have been available for Polynesian plain ware pottery using communities to colonize it by the late first millennium BC. Several early radiocarbon dates from excavations support this possibility.

2.3.1. Colonization of Pukapuka, Rakahanga and Manihiki

As was set out in the preceding sections (Section 2.2.1 and 2.2.2), the Holocene emergence above sea level of corals on Pukapuka — the closest atoll to West Polynesia — was as early as 3081 - 3320 cal. yr. BC (5270 - 5031 cal. yr. BP), and the atoll is provided with highly suitable environmental conditions for its islets to grow rapidly higher and wider. There is therefore the high possibility that Pukapuka would have been available to colonization of Eastern Lapita communities by at least the late part of first millennium BC.

In support of this, an excavation of a *taro* patch bank (site PUK-W9) in 1996 revealed that the lowest cultural layer there — consisting of brownish

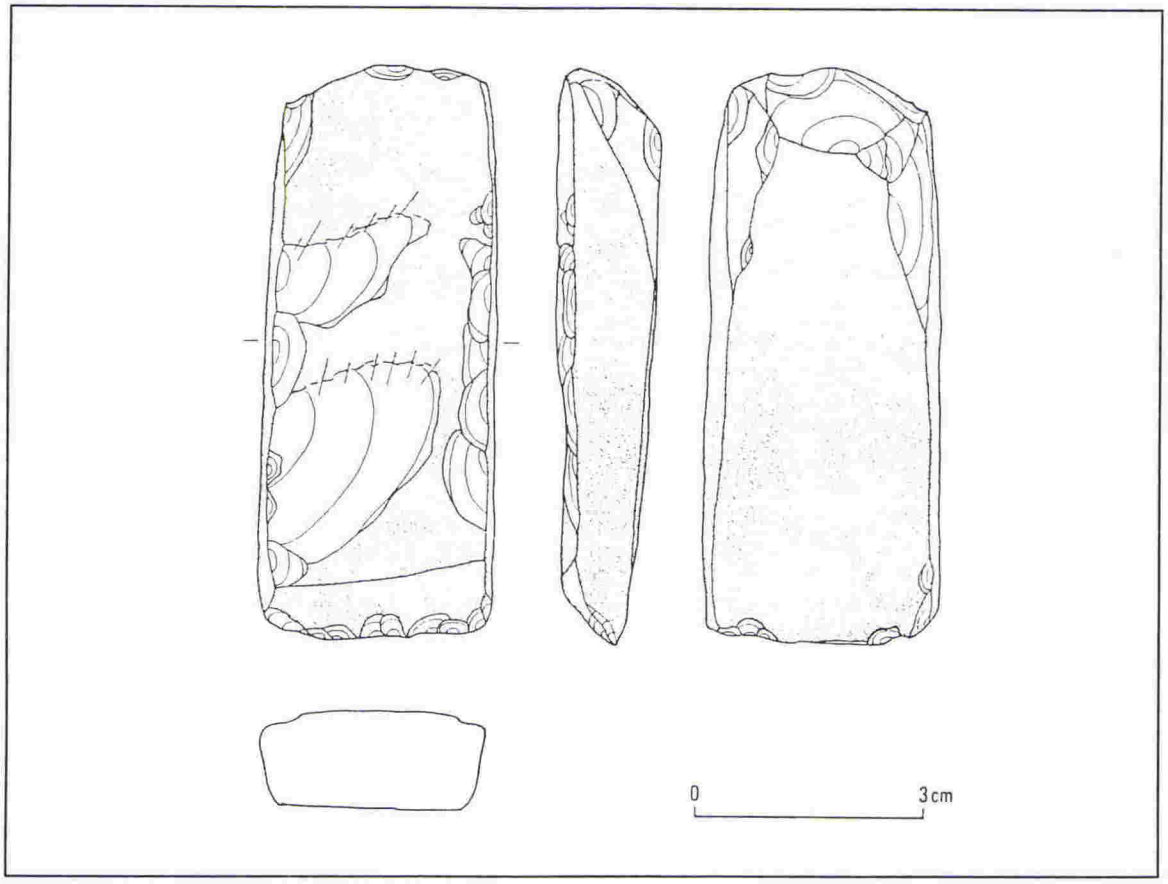

Fig. 2.3.2. Untanged basalt adz from Pukapuka

This adze was retrieved from the lowest cultural layer of a taro patch bank which was dated at 171 - 347 cal. yr. BC (WK-4524). According to its morphological characteristics, it can be classified as belonging to Type ? of the Samoan adz kit.

Because the calibrated age of 171 – 347 BC (N-5101) was derived from a Tridacna sp. shell (see in Appendix 2), it is not certain whether the date reflects the earliest settlement period in Pukapuka. Chikamori also reported a radiocarbon date of 132 – 338 cal yr. AD (N-5107) which was obtained from a charcoal sample (Chikamori and Yoshida 1988). While the exact provenance and descriptions of the layer relating to this date are somewhat unclear in his report, the expected earlier emergence of Holocene coral in Pukapuka and the rapid growth of its islets (see Chap. 2.2.1 and 2.2.2) suggest that Pukapuka, an atoll close to West Polynesia, would have been provided with conditions suitable for human arrivals by the early first millennium AD. This assumption need not be, however, associated with

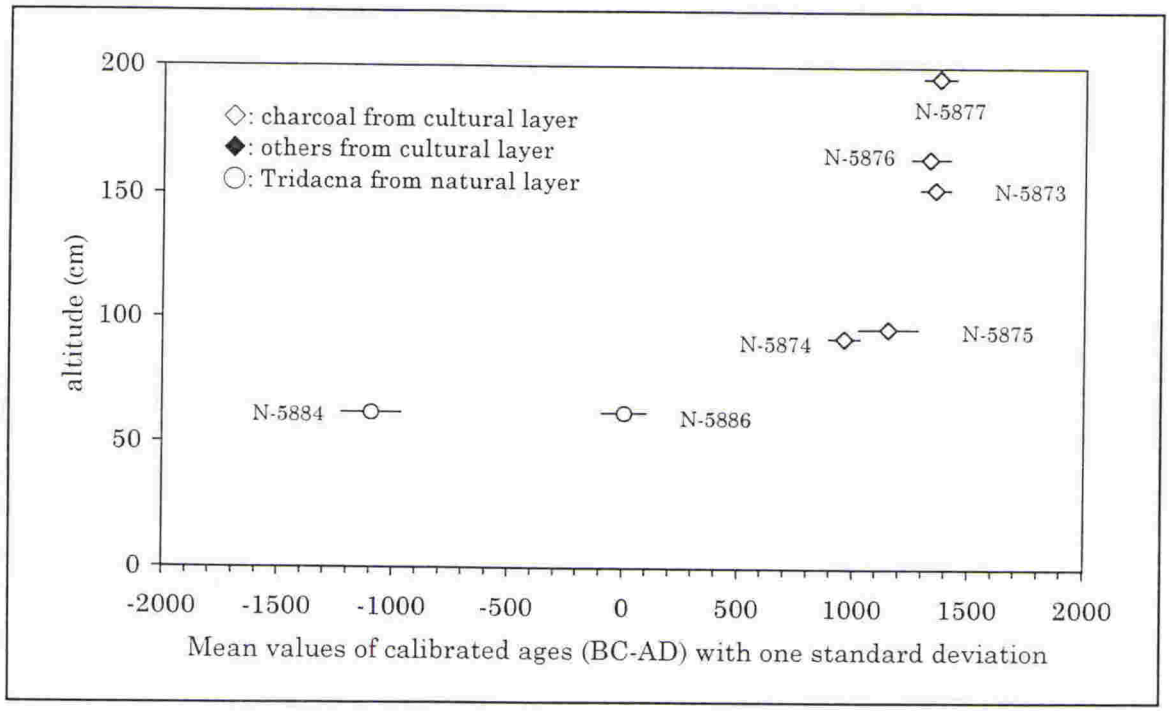

Fig. 2.3.3. Radiocarbon dates associated with atoll formation and early settlement of Rakahanga

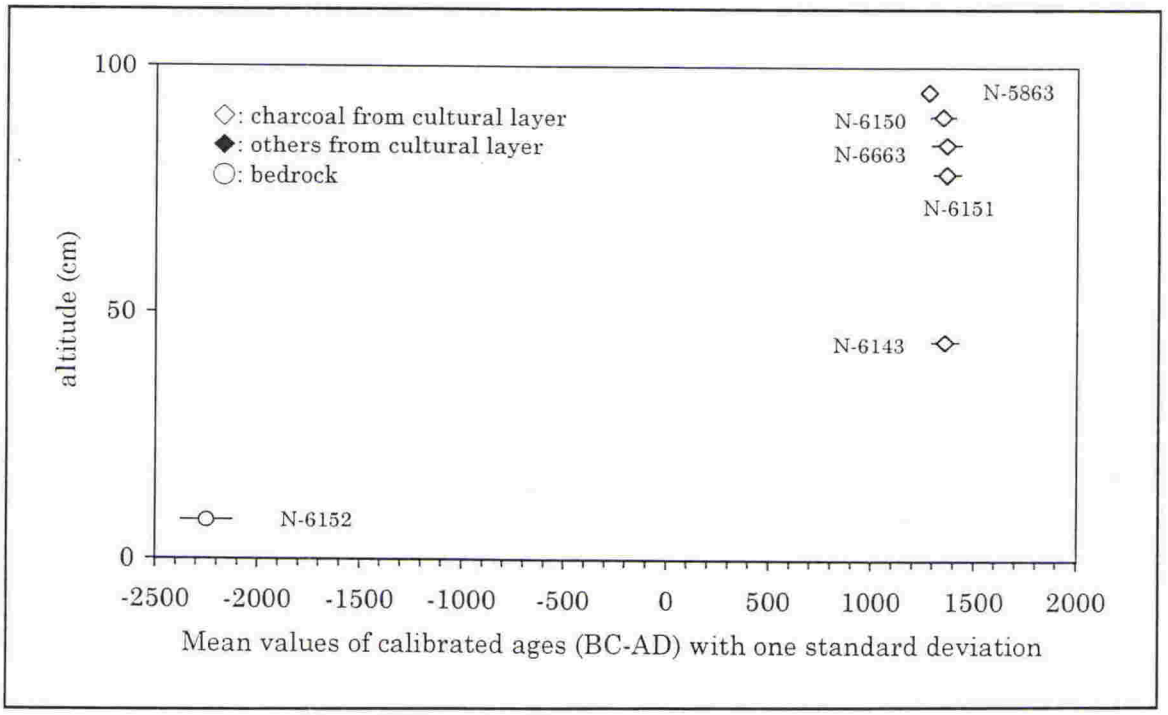

Fig. 2.3.4. Radiocarbon dates associated with atoll formation and early settlement of Manihiki

Among atolls in the Northern Cook Islands, Rakahanga and Manihiki hold an intermediate position among the conditions for islets to grow. From this viewpoint, the colonization can be expected to be somewhat later than that of Pukapuka. In support, the earliest radiocarbon dates fall into the range between 1000 AD - 1300 AD.

established settlement but simply with discontinuous usage in a process of the Polynesian eastward migration or as a camp of long-distance fishing for pearl shell from the islands of Western Polynesia (Chikamori per. comm.).

Rakahanga and Manihiki — atolls lying in the middle of the Northern Cook Islands — hold an intermediate position in time for Holocene coral emergence: 2375 - 2123 cal. yr. BC (4073 -4325 cal. yr. BP). The two atolls are also transitional in their meteorological conditions favouring islet formation. We can therefore expect from these data an intermediate set of dates for their colonization in respect to Northern Cook Islands. In support of this, the earliest radiocarbon dates of charcoal samples from our excavations show 892-1030 cal. yr. AD (N-5874) in Rakahanga (Fig. 2.3.3, and see also Table 2.2.1) and 1243 - 1304 cal. yr. AD (N-5863) in Manihiki (Fig. 2.3.4).

All dates from Rakahanga are associated with excavated sites on Te Kainga, a small islet which is close to the modern village. Viewed in this light, there is the possibility that even earlier settlement horizons may be discovered on some of the larger islets. Since Rakahanga is small but has as angular reefs in a horizontal pattern as does Pukapuka, the islets have grown more rapidly than those of Manihiki. In particular, the southern part of Rakahanga is so large and wide that this area would have been most suitable for an earlier settlement.

2.3.2. Colonization of Tongareva

Tongareva lies at the opposite end of the continuum from Pukapuka in the expected time of land formation. Thus, the predicted times of its Holocene coral emergence should be latest in the series, and this atoll is farthest of those in the northern group from the SPCZ where cyclonic waves are produced. It also has the least rainfall which would restrict the development of a groundwater lens and prevent coconut palms from achieving proper growth. Both conditions are critical to human settlement in an atoll environment. In

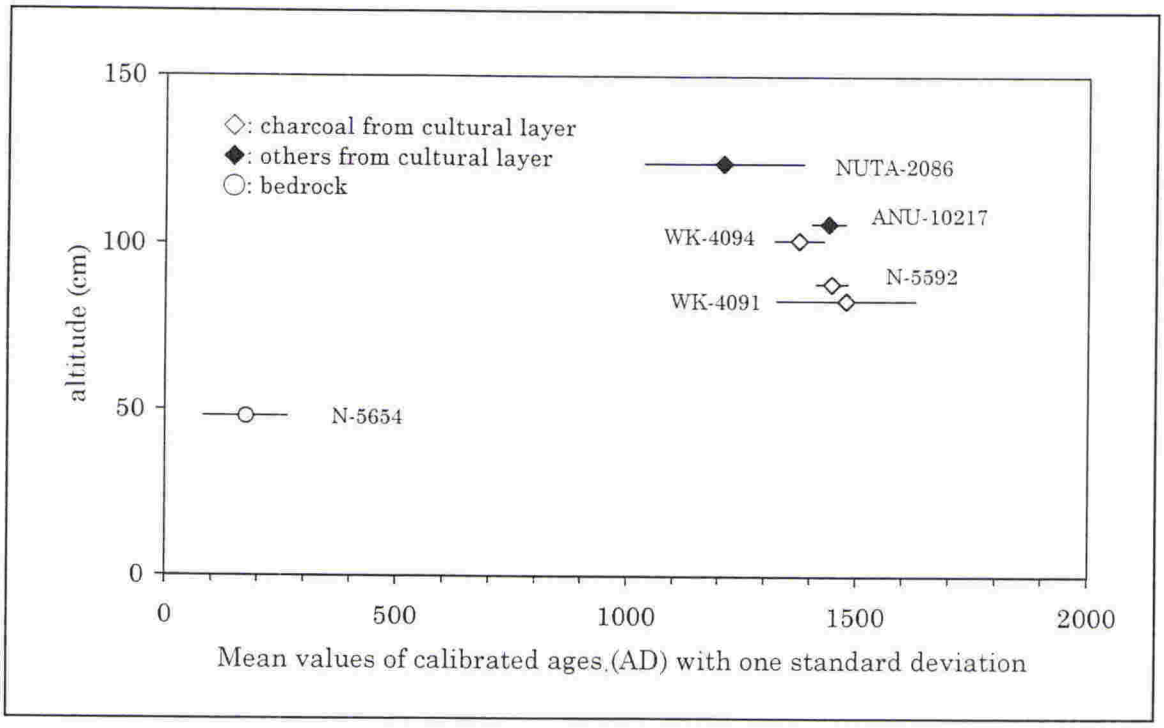

Fig. 2.3.5. Radiocarbon dates associated with atoll formation and early settlement of Tongareva

Tongareva holds an opposite position to Pukapuka in respect to conditions for land formation. It also possesses less favourable condition for islets to grow rapidly. From this viewpoint, the colonization may be expected to be latest in the Northern Cook Islands. In support of this, the most reliable radiocarbon dates concentrate in the range between 1400 AD and 1500 AD.

support of this, several records indicate that Tongareva has been subject to droughts which have heavily damaged the growth of coconut palms and then caused the diminution of food-supply (see Campbell 1985: 37) [11]. Judging from these conditions, we can speculate that Tongareva would have been colonized later than other atolls in the Northern Cook Islands.

The earliest Tongarevan radiocarbon date is 710 ± 70 yr. BP (uncalibrated) which Bellwood (1978: 206) reported. The date is, however, from a Tridacna sp. shell collected from the platform fill of a *marae*. It is therefore uncertain whether or not it relates to the island's early cultural phase (this date is thus not shown in Fig. 2.3.5). Another early date is 740 ± 173 cal. yr. BP (NUTA-2086) (see Appendix 2). This estimation is from a human bone collected from a graveyard, and so its cultural status is secure.

But it is also dubious whether the settlement on Tongareva had in fact been established by 1200 AD, particularly since the date has a very large error range of more than 150 years, and the dating of human bone is frequently unreliable.

On the basis of radiocarbon dates procured from my excavations, more reliable dates are now available. The earlier charcoal samples concentrate in the range between 1400 AD and 1500 AD (Fig. 2.3.5, and see Table 2.2.1). This range of colonization would be the latest among those in the Northern Cook Islands, and it is consistent with a colonization period which is derived from the model of atoll formation.

The period between 1400 AD and 1500 AD raises the possibility that Tongareva — the easternmost atoll in the Cook Islands — was colonized from somewhere further east as in the orthodox scenario where the Cook Islands were seen as being settled from the Society group. Several kinds of linguistic data reported by Biggs (1978: 693) would support this possibility. He points out that the Tongarevan language has characteristics which are associated with the Central Eastern group, and it would be placed in that sub-group with the proviso that it manifests certain conservative features which are probably ascribable to its geographical isolation. This contrasts with the language of Pukapuka which is clearly assigned to the western Nuclear-Polynesian sub-group (Pawley 1967: 261), and is most closely associated with Samoan and Tuvaluan/ Tokelauan languages.

Shapiro and Buck, nevertheless, describe some somatological characteristics of the Tongarevan people which differ from the linguistic evidence. Their anthropometric analysis indicates that Samoan people are the most closely allied to the people of Tongareva, as described below.

> Although Tongareva is geographically close to Manihiki and Rakahanga and cross currents, both cultural and physical, have mutually affected them, nevertheless in several important respects they are significantly different. Of all the series at my

> disposal, published and unpublished, Samoa I is the most closely allied with Tongareva, ···. [Shapiro and Buck 1936:35]

The Tongarevan people, however, have other characteristics in their cephalic diameters implying slight influence from the Society group. In sum, as Shapiro and Buck suggested, "the most satisfactory resolution ··· is the acceptance of Tongareva as the product of influences from both Samoa and the Society Islands" (Shapiro & Buck 1936: 35), although it is currently uncertain which influence was earlier.

2.4. Summary of Chapter 2

Atoll islands are generically similar to each other in topography. This results from a common process of island formation which has occurred in the geologically recent period. Their subaerial landform is mainly the joint production between sea level change in Holocene and sedimentary progradation. Before 6000 BP sea level was rapidly rising in association with eustatic movement, after which it stabilized at a higher position than at present in the Central Pacific. Responding to such a change in sea level, hermatypic corals had grown upwards and formed a broad reef flat. They finally emerged above the sea sometime after 6000 BP, because the sea level fell slightly to its present position. Once the reef flat emerged above the sea, sedimentation processes advanced the formation and extension of new land. However, it would have taken the accumulation of calcareous materials some time to form islets high and wide enough for humans to settle; probably more than 1000 years in the case of the Northern Cook Islands. This can be observed in the vertical (altitudinal) differences among the positions of the excavated and dated samples of bedrock and cultural materials from each of the atolls (Fig. 2.3.1 and Fig. 2.3.3 - 2.3.5).

Because of the seeming uniformity of geological process of atoll formation,

we are apt to view the colonization of atolls in Central Polynesia as a fairly homogeneous process. Detailed examination, however, demonstrates that local variations in the timing of Holocene coral emergence and the growth speed of subaerial landforms in fact obtain. Such variations would have affected the timing of colonization. Several reliable radiocarbon dates obtained from the Northern Cook Islands are consistent with this model. For instance, the earliest cultural horizon of Pukapuka — an atoll provided with the best conditions for islets to grow higher and wider — was dated between the late first millennium BC and the early first millennium AD. In contrast, Tongareva — an atoll which displays the opposite conditions to those of Pukapuka in respect of land formation — was dated in the range between 1400 AD and 1500 AD. What is surprising is the time lag of more than 1500 years between both atolls.

Notes to Chapter 2

(p. 24) [1] Photosynthetic algae infest hermatypic corals. They can only survive and grow within the euphotic zone or the water layer which is penetrated by sufficient radiant energy to permit these activities (Newhouse 1980: 4). Because of this, hermatypic coral has grown upwards, in association with the Holocene rising of sea level. The vertical growth of coral reefs is, however, usually limited by the mean low water level.

(p. 25) [2] The second school is divided into two groups (cf. Clark 1990). The first group argues that the sea rise achieved the modern level sometime between 6000 and 4000 BP, or perhaps as late as 2000 BP. The second group takes the position that the sea level reached its current position only recently.

(p. 25) [3] The apparent change of sea level is the sum of glacio-eustatic change associated with waxing and waning of continental glaciation in higher latitudes. Glacio-eustatic changes differ significantly between continental margins and oceanic islands (Chappell 1982: 69). In addition, some scholars have turned their attention to another factor of geoidal eustasy. They emphasize that the actual

ocean surface is not globally uniform but has bulges and depressions relative to the earth's center (Clark 1990).

(p. 25) [4] The origin of lithified reefal deposits, however, is not currently apparent. In some case, these features would be lithified storm deposits, but elsewhere they would be formed during mean sea level when that was higher than present (Woodroffe et al. 1990: 31).

(p. 26) [5] This range includes radiocarbon dates obtained from other Makatea islands in the southern group such as Mangaia, Mitiaro and Ma'uke (Woodroffe et al. 1990).

(p. 27) [6] Similar bedrock was also observed at the bottom of an excavated trench in Rakahanga Atoll. It occurred at approximately 40 cm above the present MSL, but we could not retrieve a suitable sample.

(p. 27) [7] We excavated a buried beach rock in Tongareva. It lay at 0.6 - 0.8 m above the present high tide level and about 80 m inland from the lagoon shore. The sample yielded a radiocarbon date of 1322 -1192 cal. yr. BP (N-5655) (see Appendix 2). Because of the relative difference in its position with respect to modern beachrock which can be seen within the present tidal limits, it would support the view of a higher stand of the sea and narrower islets at that period (Chikamori 1995a, 1995b; Yamaguchi 1995: 77).

(p. 29) [8] However, this chronological gradient for the emergence of Holocene corals does not extend to the west beyond Pukapuka. An aragonite bedrock from Tokelau Islands — collected from the bottom of an excavated trench — gave a radiocarbon date of 2370 ± 65 y BP (Best 1988: 115) (see Appendix 2).

(p. 29) [9] Several local factors are inferred: for instance, tectonic movement, response to isostatic movement, flexure of lithosphere and growth rate of hermatypic corals. This issue, however, lies outside the scope of an archaeological study.

(p. 33) [10] In the 1996 expedition, Keio University carried out a deep excavation of a flood plain in Ngatangiia Village, Rarotonga. We observed more than 6 m of alluvial deposits at this site. Prof. Chikamori is now processing the datable materials and pollens. While I can not provide any detail statement here until his analyses are completed, the depositional speed of alluvial soil appears to be extremely fast. If so, there is the possibility that early settlement sites are covered with fairly thick deposits.

(p. 38) [11] Strong droughts heavily damage coconut trees and affect the harvest of nuts for the long term, since it takes trees thirty-four months to come into bloom after budding, and then takes nuts 12 or 13 months more to ripen. It is said that the effect of droughts on nuts continues for at least two years (Sato 1983: 25).

Chapter 3

Interpretation of Ceremonial Architecture: A Case Study of Tongarevan *Marae*

The first European contact with Tongareva occurred in 1816 AD. Since then, its society has suffered some drastic changes. This can be seen, for instance, in the demographic fluctuation. Many of the people instantly converted to Christianity after the London Missionary Society sent pastors (LMS) to the atoll in 1854 AD. William Wyatt Gill, a LMS missionary, reported in 1862 that "the total number of inhabitants on Penrhyns [which is the European name for Tongareva] is 700, of this number 111 are church members" (Campbell 1984: 27). However, the *Adelante* (a Peruvian slaver vessel), which visited Tongareva in 1862 AD, transported many people to plantations in Peru (Maude 1986: 2-11). Gill reported that only eighty-eight inhabitants remained in 1863. The population had quickly recovered to 300 inhabitants by 1870 AD, but this number included 111 Gilbertese who were dumped on Tongareva by another Peruvian vessel and 130 Tongarevan returning after a period spent working on Tahiti (Campbell 1985: 12). In 1901 AD, the Cook Islands were annexed by New Zealand. Since then the population of Tongareva has fluctuated between 300 and 600.

The demographic decline, the accidental immigration of Gilbertese, and the recent emigration to urbanized cities has had a negative influence upon the inter-generational transmission of tradition. In addition, the changes of settlement patterns in this atoll would have accelerated the disappearance of local knowledge. While its inhabitants had been settled in a dispersed fashion on most habitable islets, the LMS constructed six villages (Omoka, Te Tautua, Tepuka, Motu Unga, Mangarongaro and Motukohiti) to gather the converted close to the chapels. These villages have also been deserted as a result of the demographic decline cited above, and there are now only the two villages, Omoka and Te Tautua, which lie close to the wide, deep reef channels

through which cargo boats enter the lagoon of Tongareva.

Ironically, these changes in settlement patterns would have prevented prehistoric architectural features from being demolished. Several archaeological surveys have discovered numerous features including ceremonial structures called *marae* in heavy bush on uninhabited islets (Buck 1932a; Bellwood 1978; Yamaguchi 1995). Referring to the detailed descriptions of the Tongarevan traditional life, written by E.H. Lamont (1867) who was an American trader shipwrecked on the atoll in 1853 AD, I will try to interpret, in this chapter, the various meanings encoded in these architectural features.

3.1. Tongarevan Architectural Features

3.1.1. Categories of Architectural Features

A large number of architectural features, in particular rectangular *marae*, are a unique characteristic of Tongareva, and in this way it stands unparalleled in the Northern Cook Group. The following list shows the main categories of archaeological sites and the number in each category. Fig. 3.1.1 provides the site-distribution for this atoll.

1) Rectangular *marae* ---------- 23
2) Non-rectangular courtyards ---------- 6
3) Mounded ovens ---------- 6
4) Graveyards ---------- 5
5) Other structures ---------- 2

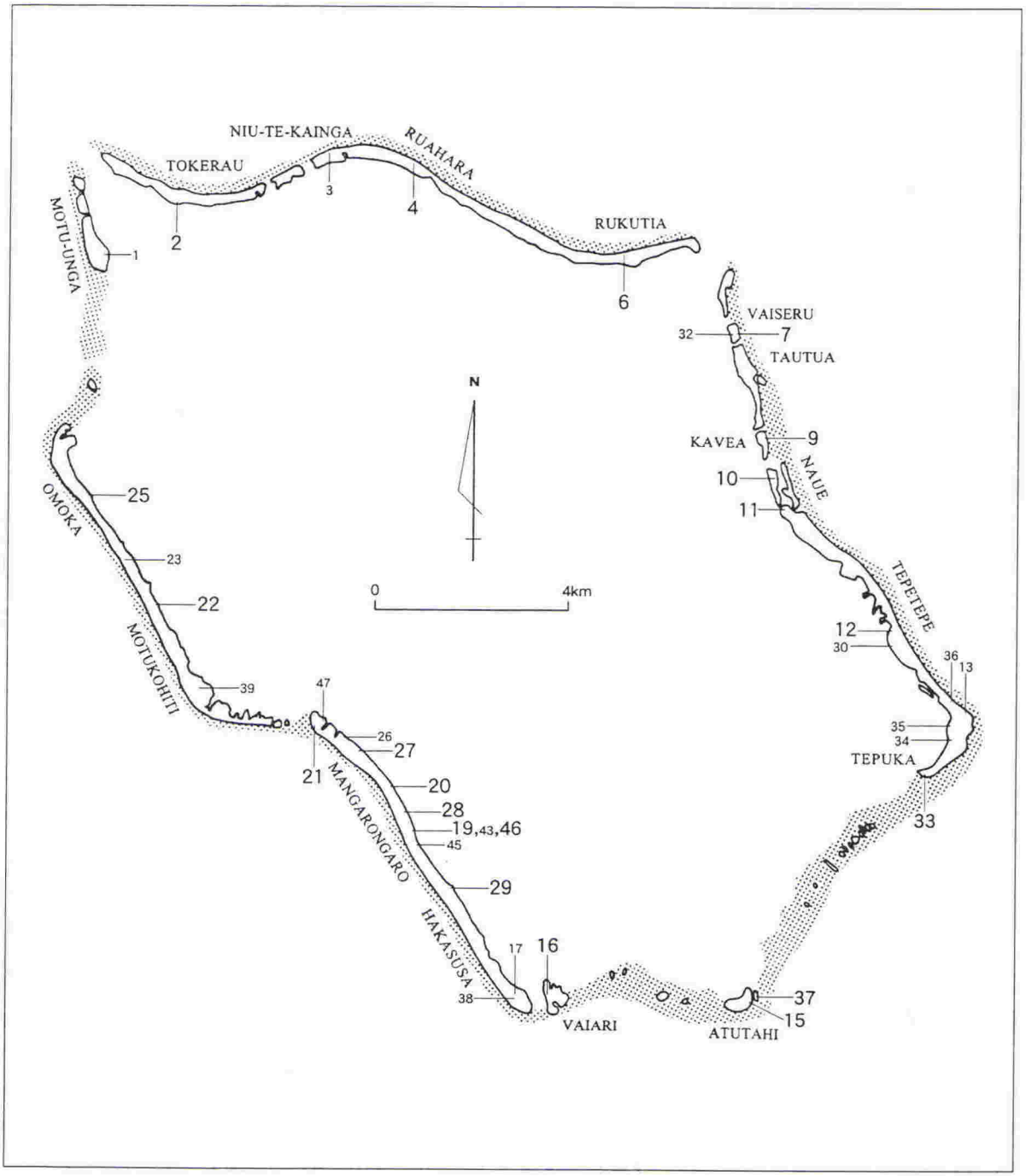

Fig. 3.1.1. Distribution of archaeological sites in Tongareva Atoll

Large numbers indicate rectangular *marae*, and small numbers are sites belonging to other categories. Some numbers represent site-complexes. These consist of several structures, each of which has a particular suffix such as TON-09/I non-rectangular courtyard and TON-09/II *marae*.

1) Rectangular *marae*

Among the architectural features, rectangular *marae* are the most impressive both in number and in size. Twenty-three *marae* have been recorded. The largest one is about 1600 m^2 in size and the average is nearly 740 m^2 [1]. They are generally characterized by a rectangular court, coral uprights and an inner component. Their general design is similar to *marae* of the Society Islands and Tuamotu Archipelago, but Tongarevan *marae* have at least two unique characteristics which are not found in other island groups. The first characteristic is a morphological feature of the inner component. Eight *marae* have a platform at one end of the court, but most of the remaining *marae* have a set of double stone arrangements lying at the equivalent position to that of the platform within former courts. This issue will be discussed later in Section 3.4.

The second unique characteristic, as Emory (1970: 92) has already pointed out, is coral uprights standing around the peripheries, as well as the back line of a court, to which the inner component is adjacent. Lamont's description (1867: 121) indicates that such uprights functioned in ceremonies as positions where priests and several attendants had their seats or stood. Many of these uprights are worked into various shapes such as flanged, knobbed, notched, shouldered, medial curved and perforated (Buck 1932a: 155; Yamaguchi 1995: 22). The worked uprights certainly suggest a culture-historical relation between Tongareva and the Tuamotu Archipelago (Emory 1934: 6-7). However, none of *marae* in Tuamotu have uprights standing around peripheries of their courts [2].

Emory (1970: 92) discussed the possibility that such peripheral uprights may have originated from those which stand on platform-type *ahu*, as in the Tahiti-Tuamotu design, and that they finally supplanted the *ahu* which were then dropped from the Tongarevan design. Tongarevan *marae* which have a platform, however, are also provided with peripheral uprights. Thus, Emory's suggestion is inconsistent with the reality, and this characteristic would have to be considered as resulting from local development of the ceremonial

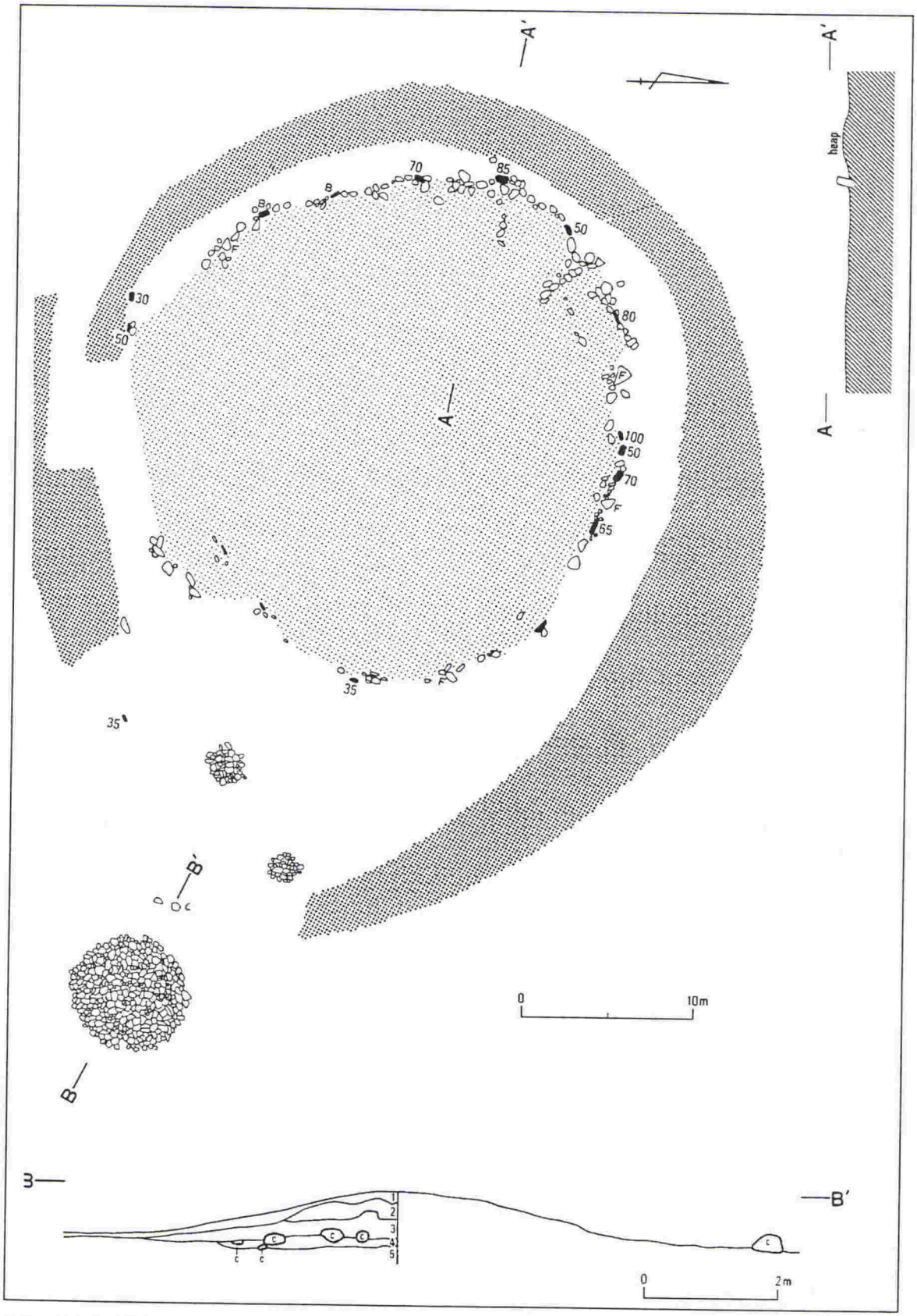

Fig. 3.1.2. TON-03 circular courtyard in Niu-te-Kainga, Tongareva

This courtyard has three mounds of heat-shattered coral lumps. Turtle bones were retrieved from the lower layer of the largest mound. The layer was dated at 1460 - 1657 cal. yr. AD (N-5591).

system rather than from any culture-historical relations to other island groups.

2) Non-rectangular courtyards

There are other structures with a space surrounded by several coral uprights. According to Buck's (1932a) and Bellwood's (1978) descriptions, it is evident that their horizontal plans are not rectangular but circular, oval or indeterminate. These structures resemble a ceremonial site reported from the Ellice Islands by Wyatt Gill (1855: 14), who described it as "consisting of an oval, low enclosure, composed of flat stones, some higher than others, each representing a distinct divinity." This similarity would suggest a culture-historical relationship between Tongareva and Western Polynesia [3]. In order to examine the function of non-rectangular courtyards in this atoll, it would be more useful to scrutinize local information on each site rather than to look at culture-historical relations.

These non-rectangular courtyards can be divided into two groups: the first one consists of four courtyards, each of which lies close to a rectangular *marae* (TON-09, 10, 15 and 28). Buck (1932a: 181-2) collected a story which stated that dancing was performed on an open space close to a *marae* after ceremony had finished. This statement suggests the possibility that this group of non-rectangular courtyards would have contained subsidiary activities related to ceremonies performed at the adjacent rectangular *marae*.

The second group includes two sites (TON-03 and 17) which are spatially independent from any rectangular *marae*. One of Buck's informants said regarding site TON-17, that the people had gathered there and danced to the music "to bid farewell to the old year and welcome the new year" (Buck 1932a: 216). No ethnographic account was recorded for site TON-03, but this structure has three mounds of heat-shattered coral lumps within the confines of its courtyard, and heated turtle bones were retrieved from the excavation of the largest one (Fig. 3.1.2). In light of this, the non-rectangular courtyard of

the first group could be associated with some distinct ceremony with a specific purpose such as feasts of turtle, one of the sacred animals in Polynesia.

3) Mounded ovens

Archaeological surveys in this atoll discovered six mounds of heat-shattered coral lumps. Five mounds are spatially associated with other architectural features; three mounds are within TON-03 courtyard; one mound faces TON-21 *marae*; and the other is within TON-47 settlement. Only one mound (TON-01) is not adjacent to any visible architectural feature.

These mounds are designated as "turtle ovens" (e.g. Buck 1932a: 159), and turtle bones and turtle shells have been excavated from several mounds. Lamont, joining a turtle ceremony in this atoll, ate a piece of flesh which was cooked in a large fire "prepared on an elevation of stones" (Lamont 1867: 182). This description supports the possibility that the above mounds were ovens used to cook turtles in ceremonies.

The people in Polynesia generally believed that turtle was one of sacred animals and caused internal diseases if they ate it without removing the sacredness through proper ceremonies (e.g. Williamson 1924: 230 [Samoa], 254 [Tonga], 269 [Society Islands], 277 [Southern Cook Islands]). Emory provided a schematic reconstruction of Napukan *marae* at the time of a turtle ceremony on the basis of descriptions of eye witnesses (Emory 1947: 59-88, see also Fig. 1). Two ovens adjoining the front line of *marae* are discernible in his sketch, and their location is consistent with a Tongarevan case (TON-21 *marae*). However, these Napukan ovens are not mounds but pit ovens dug into the ground, and differ markedly in morphology from turtle ovens in Tongareva (see also a chant in Emory 1947: 84). Such mounded ovens, to my knowledge, are unique in Polynesia. While the concept of turtle feast was shared by East Polynesians, cases of mounded ovens occur only in atolls of Rakahanga and Manihiki (see Chapter 5).

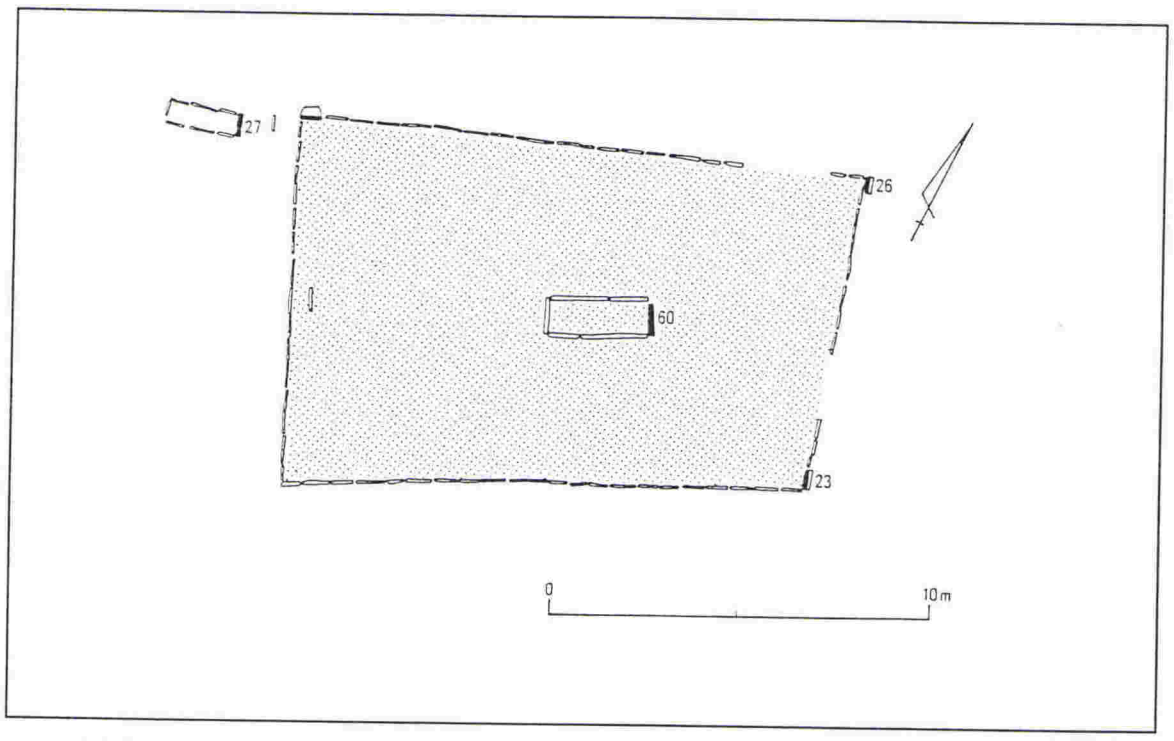

Fig. 3.1.3. TON-36 graveyard in Tepuka, Tongareva

This graveyard — called Hinau by our informant —lies within a clump of coconut trees on the ocean side of Tepuka. Three short slabs of approximately 25 cm high stand at the corners of court enclosed with curbstones. One large grave lies in the center of court. Another smaller grave exists outside the court. A fragment of human bone which was collected from the center grave was dated at 1037 - 1383 cal. yr. AD (NUTA-2086).

4) Graveyards

There are numerous graves which are now covered with undergrowth. Most of them are generally rectangular spaces enclosed by curbstones which average about 2 m by 1 m. A few graves are enclosed by short slabs set on edge, with a taller upright stuck at one shorter end, and are more than 3 m in length. The inside is filled with coral gravel. However, the most impressive and sophisticated structures of the burial sites would be the graveyards. Five structures have been discovered so far. They have a rectangular court enclosed with curbstones, within the confines of which one or more larger graves exist (Fig. 3.1.3). While similar graves or cists are reported from the Tuamotu Islands (cf. Seurat 1905: 477), those with a rectangular court are unique in East Polynesia. Rather, the general configuration of Tongarevan graveyards seem to be analogous to several rectangular burials in the Tongan Islands such as the Otalafaiva Site in Euakafa Island; although their courts are

raised and cists (or vaults) are set under the surface (Mckern 1929: 49-51).

Of interest are the morphological variations of burial sites which are commonly discernible on several islet of Tongareva. This suggests that the funeral activity would have been associated with the socio-political ranking at the level of a district (*huaanga*) and not at the higher level of the entire atoll. In addition, all graveyards lie in secluded locales in a similar way to most rectangular *marae*. It is noteworthy that several *marae* also contain graves. Seen in this light, the graveyards would function as substitutes for *marae* in the Tongarevan spatial organization.

5) Other structures

There are two sites not belonging to any of the preceding categories. One of them is a human-shaped piece of masonry (TON-23), which is, as Bellwood (1978: 173) stated, one of the strangest sites in Polynesia. The other (TON-35) is the largest stonework on Tongareva, which our informants described as a pond for Milkfish (*Chanos chanos*) (see details in Yamaguchi 1995: 67-72).

3.1.2. Cultural Sequence of Architectural Features

Keio University's archaeological expeditions, along with the Bellwood's report, provided several radiocarbon dates to clarify the chronological order of Tongarevan architectural features (Table 3.1.1 and Fig. 3.1.7). The following is a summary of each site-category.

1) Rectangular *marae*

The earliest date recorded for a Tongarevan *marae* is 1301 - 1423 cal. yr. AD (ANU-1156) (Bellwood 1978: 176, 206). It is also one of earliest dates for the human colonization of this atoll. This date was, however, taken from a Tridacna shell collected at a platform fill of TON-29 *marae*. It is thus open to debate whether or not the date represents the construction age of this structure. More reliable dates on rectangular *marae*, taken from charcoal

Table 3.1.1. Radiocarbon dates from Tongarevan architectural features [1]

Site category	No.	Lab. code	Site	Material	^{14}C yr. BP	cal. AD (1σ)[2]
1. rectangular marae	1	R-21336	TON-28/I	charcoal	modern (81 ± 61)	within the past 200 yrs.
	2	NUTA-2081	TON-33 grave 1	human bone	modern (140 ± 170)	within the past 200 yrs.
	3	WK-4092	TON-33	charcoal	modern (152 ± 70)	within the past 200 yrs.
	4	WK-4090	TON-19	charcoal	modern (184 ± 116)	within the past 200 yrs.
	5	ANU-10218	TON-21	turtle bone	620 ± 60	1673 — 1832
	6	WK-4091	TON-21	charcoal	470 ± 130	1327 — 1627
	7	ANU-1156	TON-29	Tridacna	710 ± 70	1301 — 1423
2. circular courtyard	8	N-5581	TON-03	charcoal	330 ± 80	1460 — 1657
	9	N-5590	TON-03	charcoal	370 ± 75	1445 — 1643
3. mounded oven	10	WK-4531	TON-47	charcoal	modern	within the past 200 yrs.
	11	ANU-1152	TON-01	charcoal	270 ± 100	1487 — 1954
	12	N-5591	TON-03	charcoal	330 ± 80	1460 — 1657
	13	N-5590	TON-03	charcoal	370 ± 75	1445 — 1643
	14	NZ-1921A	TON-01	charcoal	380 ± 50	1448 — 1525
	15	ANU-10217	TON-47	turtle bone	960 ± 60	1402 — 1475
	16	WK-4094	TON-47	charcoal	560 ± 50	1321 — 1427
4. graveyard	17	NUTA-2086	TON-36	human bone	700 ± 160	1037 — 1383
5. fishpond	18	N-5594	TON-35	Tridacna	modern (140 ± 70)	1676 — 1870
	19	N-5586	TON-35	Tridacna	310 ± 70	1517 — 1677
	20	N-5589	TON-35	Tridacna	340 ± 70	1494 — 1662

(1) The detail of each date is provided in Appendix 2.

(2) Dates of samples originated from marine environment were calibrated with the Δ R value (45.0 ± 30.0) obtained from the South Pacific (Stuiver et al. 1986; Stuiver & Braziunas 1993).

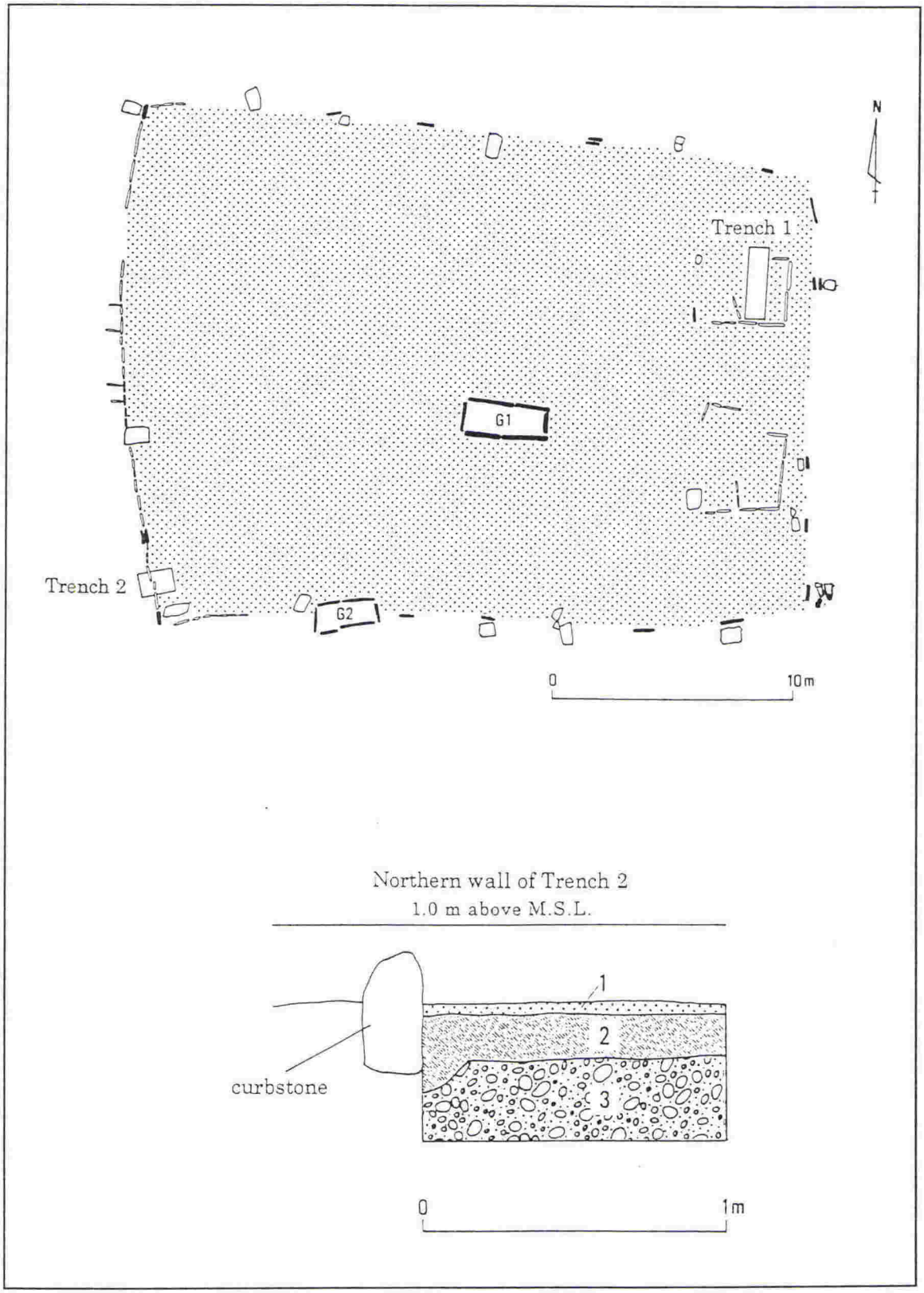

Fig. 3.1.4. TON-33 *marae* in Tepuka and stratigraphic profile of Trench 2

This site was discovered at the southern end of Tepuka in 1995. I excavated two small trenches. A charcoal sample from Layer 2 gave a radiocarbon date of modern (WK-4092). It would be associated with the construction period. The Grave 1 at the center of court also provided a sample of human bone dated at modern (NUTA-2081).

samples, are concentrated within the last 200 years (these dates are designated as "modern" by radiocarbon determination) except the radiocarbon dates from TON-21 *marae*.

In 1995, I excavated small trenches at four *marae* including site TON-33 on the islet of Tepuka (Fig. 3.1.4). Layer 1, the surface sediment, consisted of a thin layer of coral gravel (*kirikiri*). Layer 2 was a humic brownish black sand with coral gravel and contained flecks of charcoal. A charcoal sample from Layer 2 yielded a radiocarbon age from the last 200 years (WK-4092). Layer 3 consisted of yellowish brown sand and gravel, which contained no cultural material and is considered to be naturally formed. The hollow dug to set curbstones along the peripheries of *marae* was filled with the brownish black sand of Layer 2. This indicates that the date from Layer 2 would be associated with the construction of TON-33 *marae*.

Similar stratigraphic conditions were observed at the sites of TON-19 and TON-28/I on the islet of Mangarongaro as well. This suggests that most of the rectangular *marae* would have been constructed within the last 200 years. Lamont, who stayed on this atoll in 1853, observed several ceremonial places including *marae* in Tepuka and Mangarongaro. His description, along with the radiocarbon dates noted above, leads us to conclude that the construction of Tongarevan *marae* occurred largely between 1750 AD and 1850 AD.

Among the excavated *marae*, only site TON-21 has yielded earlier radiocarbon dates. The northeastern end of front line of curbstones was chosen for a small excavation in the 1995 field survey. Layer 2, a thick layer consisting of brownish gray coral gravel with sand, lay below a humic surface soil (Layer 1). It contained culturally derived materials such as flecks of charcoal and several fragments of turtle plastron. This layer was not present outside the court of this *marae*. It is thus evident that the soil of Layer 2 was augmented to make the leveled court (Fig. 3.1.5). The hollow dug to set curbstones along the front line was filled with similar soil to that of Layer 2.

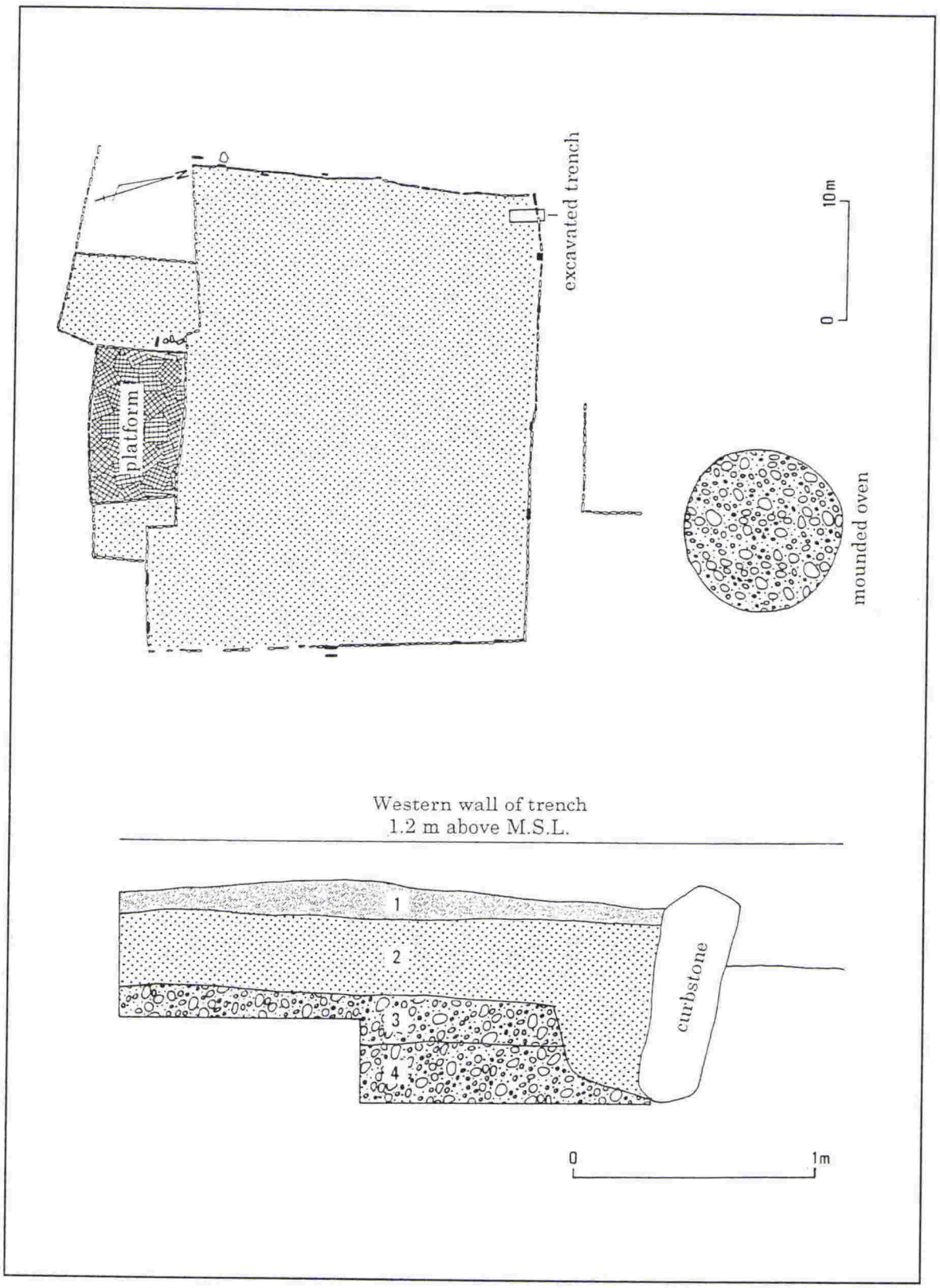

Fig. 3.1.5. TON-21 *marae* in Hangarei and stratigraphic profile

While this site shares common characteristics with other *marae*, it is also provided with unique features such as a platform projecting outward and a mounded oven. I excavated a small trench in 1995. From the layer associated with the construction period I obtained two radiocarbon dates of 1673 - 1832 cal. yr. AD (ANU-10218) and 1327 - 1627 cal. yr. AD (WK-4091).

Layer 2 covered Layer 3 which brownish gray gravel and cobbles which would have been naturally accumulated.

Two radiocarbon dates were obtained from Layer 2: 1327 - 1627 cal. AD from a charcoal sample (WK-4091) and 1673 - 1832 cal. AD from a turtle plastron (ANU-10218). While these dates show a marked discrepancy, there is a moot point with regard to dates obtained from turtles. Since they range widely throughout the Pacific Ocean (cf. Tuato'o-Bartley et al. 1993), it is quite difficult to determine the value of the marine reservoir effect, which varies from locale to locale [4]. What should be noted, however, is that the more reliable charcoal date from site TON-21 — probably falling into the range between 1600 AD and 1700 AD — is markedly earlier than those from other *marae*.

Lamont visited TON-21 *marae* in 1853. Among several *marae* which Lamont observed, only this site was abandoned (Lamont 1867: 161-2). While site TON-21 can be classified as belonging to the type of *marae* having a platform, it has also unique characteristics which are not found in other Tongarevan *marae*. Firstly, the platform is not incorporated into the rectangular court but projects outward from the rear of main court, and a small enclosure of curbstones is attached to each side of platform. The second, and most striking characteristic, is the fact that a large mounded oven is ancillary to this *marae*. This unique characteristic, taken together with turtle bones excavated from the court, suggests that site TON-21 is the only *marae* in this atoll which was evidently associated with the turtle ceremony. This fact, coupled with its much earlier construction date, sets site TON-21 apart from other rectangular *marae* [5].

2) Non-rectangular courtyards

Site TON-03 lying on a small islet called Niu-te-Kainga was surveyed in detail by Keio University. There were three mounded ovens within the confines of this site, and the largest one was excavated (Fig. 3.1.1). The mound was about 7 m in diameter, and the top rises up to 80 cm above ground level.

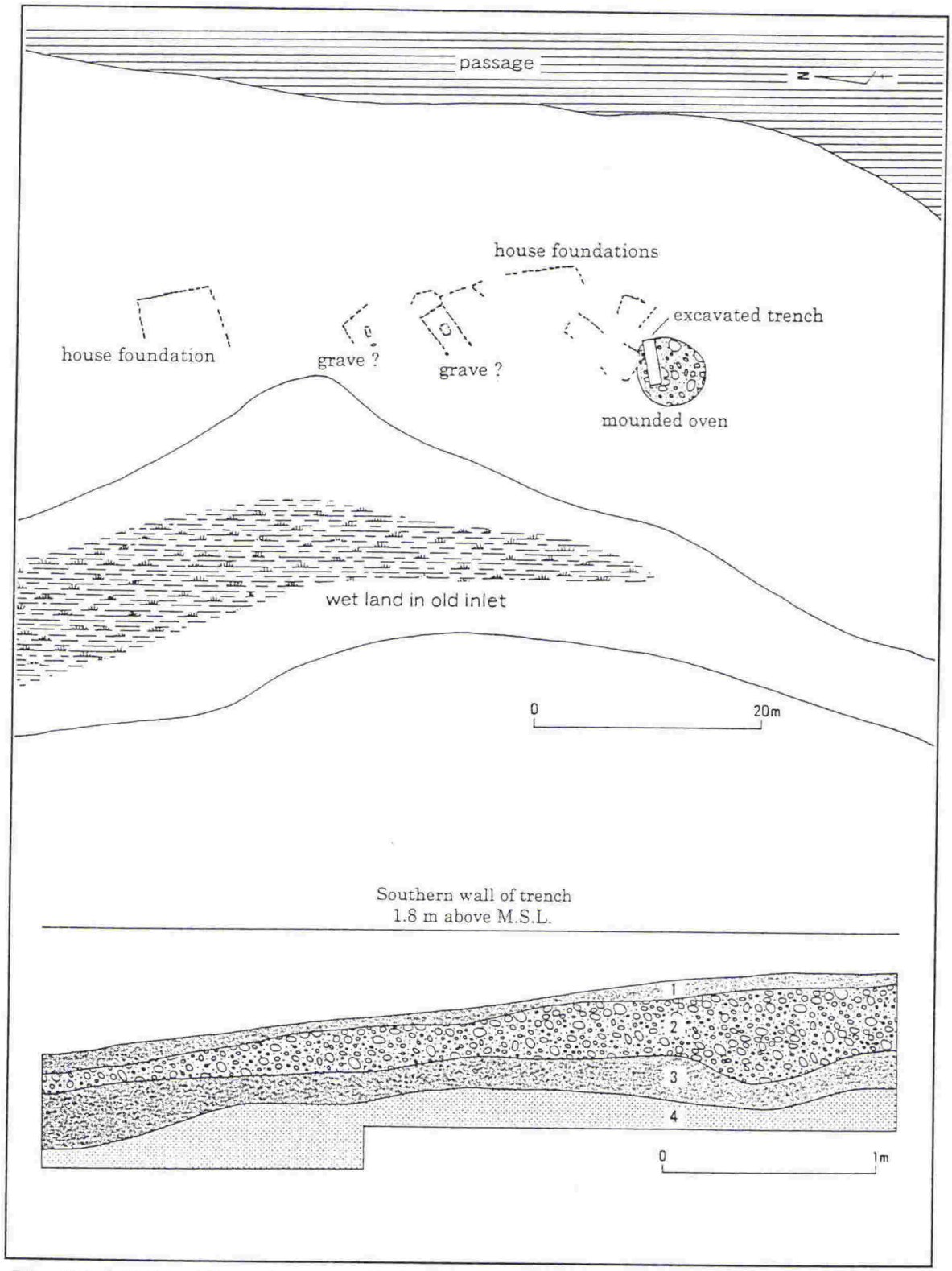

Fig. 3.1.6. TON-47 settlement site in Hangarei and stratigraphic profile of the mounded oven

This settlement lies on a narrow elevation of an old sand spit facing a reef passage. It is the closest settlement to TON-21 *marae*, and would be the settlement which Lamont reported as the only inhabited part on the Hangarei. In 1995 I excavated a mounded oven on this site. The lowest layer was dated to the 15th century AD.

The excavation of an 1 meter wide trench extending from the center to the eastern edge of the mound yielded two radiocarbon dates: 1460 - 1657 cal. yr. BP (N-5591) from Layer 4 (lowest layer) and 1445 - 1643 cal. yr. BP (N-5590) from Layer 3. These dates suggest — while not directly — that TON-03 circular courtyard was constructed around the 16th century AD.

3) Mounded ovens

In addition to a mounded oven on site TON-03, three mounds in other sites have been excavated. Bellwood (1978: 189-194) surveyed TON-01 mounded oven on the islet of Motu Unga. A charcoal sample from the lower part of mound (Layer 7) yielded a radiocarbon age of 1448 - 1525 cal. yr. AD. The upper layer (Layer 1) contained European derived materials such as quantities of bottle glass and a European bone button. These materials indicate that the mound had been used at least since the early 16th century AD until the 19th century AD.

I also excavated a mounded oven on TON-47 settlement in the islet of Hangarei (Fig. 3.1.6). This site is the closest settlement to the TON-21 *marae* which was associated with the turtle ceremony. The deposits in this mound are stratigraphically divided into four layers. The lowest, Layer 4, consisted of a grayish yellow brown sand with coral gravel and represented the original surface before the construction of this mound. Layer 3, which contained quantities of turtle bones, is associated with two radiocarbon dates: 1402 - 1475 cal. yr. AD from a Turtle plastron sample (ANU-10217) and 1321 - 1427 cal. yr. AD from a charcoal sample (WK-4094). A charcoal sample collected from the upper part of Layer 2, which is covered only the humic soil of Layer 1, yielded a radiocarbon date of modern (WK-4531). These dates thus indicate that this oven had been used since the 15th century AD until the period of European contact, very similarly to the site TON-01.

4) Graveyards

A radiocarbon date of 1037 - 1383 cal. yr. AD (NUTA-2086) has been obtained from a fragment of human bone which was collected at the surface of

the structure or cist lying at the center of TON-36 graveyard. Human bones can be grossly affected by the uptake of old carbon from coral deposits and are subject to other forms of contamination (cf. Spriggs & Anderson 1993: 207). Thus, this date is problematic and is unacceptable without any other comparable data. The calibrated date also has a large interval, even at one standard deviation.

I obtained another date associated with a grave (Grave 1) lying within the confines of TON-33 *marae* on Tepuka (Fig. 3.1.4). The sample was a fragment of human bone, and the radiocarbon date obtained falls within the past 200 years (NUTA-2081). Lamont's description of this *marae* in Tepuka gives us a clue in estimating the construction period of the grave. He wrote, "In the center were several tombs of great Tepuka chiefs, long since called to their fathers" (Lamont 1867: 235). It is, at least, evident that these graves were constructed within the confines of this *marae* prior to the Lamont's visit. There is therefore the possibility that the graves within the TON-33 *marae* could have be constructed between 1750 AD and 1850 AD, probably in the same period as the TON-33 *marae* construction [6].

The radiocarbon date from the grave in site TON-33 may be also significant in comparison with that from TON-36 graveyard. Again, human bones are very susceptible to contamination, and it is thus currently impossible to obtain radiocarbon dates from them at a reliable level of accuracy. Both the human remains noted above, however, were in similar depositional conditions in that they were covered with coral gravel and in the same type cists. The comparison of these two dates yielded by them shows, at least, the difference between construction periods of the graveyards and the graves in *marae*.

5) Others

During the 1989 Keio University Expedition, we obtained three radiocarbon dates associated with TON-35 fishpond (Table 3.1.1). The excavation revealed that only Layer 3 contained culturally derived materials,

and thus this layer would have accumulated during the usage of this fishpond (Yamaguchi 1995: 71-72). All the above dates came from this layer. One of them is modern (N-5584) and differs from the two other dates which are distributed around 1600 AD (N-5586 and N-5589). The first date, however, can be calibrated to 1674 - 1870 cal. yr. AD, with an estimated ∂^{13} value (2.7 ± 0.2) and the ΔR value (45.0 ± 30.0) [7]. While all dates were obtained from Tridacna sp. shells, and are thus open to debate, the limited data suggest that the construction of TON-35 fishpond would have occurred during the 15th Century (see also Appendix 2).

No radiocarbon date associated with the human-shaped masonry (TON-23) has been obtained. As I stated in the archaeological monograph in Tongareva Atoll (Yamaguchi 1995: 69), it might be possible to designate this site as a type of 'esoteric efflorescence' a term which Sahlins (1955) had used to explain the construction of the massive stone images on Easter Island. However, the masonry must also be scrutinized within local conditions or contexts, including information on its construction period, since this site is an unparalleled architectural feature in Polynesia.

Available radiocarbon dates for each category are described in the above section. On the basis of these data, a tentative cultural sequence of ceremonial architecture — while not complete — can be reconstructed as following (see also Fig. 3.1.7). The earliest structures are the mounded ovens associated with turtle ceremonies. They are estimated to have appeared around the 15th century AD in Tongareva [8]. Turtle ceremonies were also performed around 16th century AD at non-rectangular structures such as TON-03 circular courtyard which was surrounded with upright stones. Then, probably in the late 17th or the early 18th century AD, TON-21 *marae* was constructed for turtle ceremonies. While this structure has a rectangular court, it shares with TON-03 several characteristics such as ancillary mounded ovens and uprights surrounding the courtyard. Finally, many rectangular *marae*, — currently supposed to be independent of turtle ceremonies — occurred in various locales in late prehistory (within the past

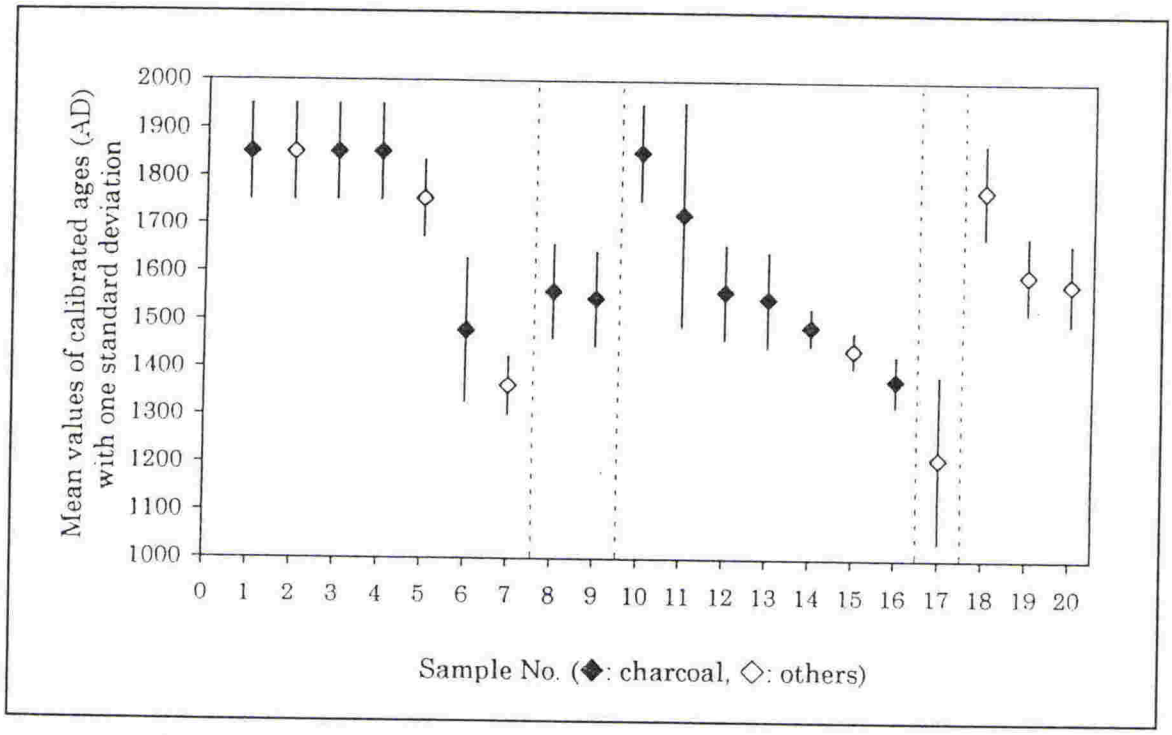

Fig. 3.1.7. Chronological order of Tongarevan architectural features
Samples 1 to 7: rectangular *marae* (Category 1), 8 and 9: circular courtyard (Category 2), 10 to 16: mounded oven (Category 4), 17: graveyard (Category 3), and 18 to 20: fishpond (Category 5).

200 years). Some of these *marae*, replacing the rectangular graveyards, also functioned as burial places of chiefs.

3.2. Spatial Position of *Marae* — Meanings at the Level of Household Units —

In Tongareva there are currently only two inhabited islets, Omoka and Tautua, where the people congregate around chapels and form their villages. Such a village-like pattern of settlements differs greatly from prehistoric pattern. The current settlement pattern was established by the London Missionary Society (LMS) in the late 19th century AD (Campbell 1985: 11). Prior to this, the Tongarevan people had been dispersed throughout all the habitable islets. In order to set out the spatial positions of *marae*, therefore, it

is important to reconstruct the prehistoric settlement patterns.

3.2.1. Prehistoric Settlement Pattern in Tongareva Atoll

Lamont's book provides quite useful information which we can use to reinforce archaeological data on the prehistoric settlement pattern on Tongareva. During his stay on the atoll he traveled to many islets and made several observations of various settlements. The first of all to be pointed out is one of his experiences that "even when no one was visible, immediately a tree was climbed for drinking nuts some old woman or child appeared as if by magic and raised the alarm" (Buck 1932a: 60). This indicates that there were many scattered settlements among clumps of coconut trees (e.g. Lamont 1867: 285).

There seems to have been some arable land for *puraka* (*Cyrtosperma chamissonis*) cultivation (Fig. 3.2.1), but no land for *taro* (*Colocasia esculenta*) which grows in fresh water wet environment [9]. This lack of suitable environments for *taro* cultivation arises from the low rain fall. Tongareva atoll, lying at the edge of the South Pacific dry zone, receives only 1883 mm of rainfall per year; lowest in the Northern Cook Islands (Thompson 1986: 18), and probably not enough to cultivate *taro* consistently. The people therefore lived mostly on coconuts which not only supplied them sometimes with all their food, medicine, and decoration, but also their clothing and building materials (Lamont 1867: 155; Linton 1933: 305).

According to information from copra plantations on Tongareva, coconut trees are best planted at least 10 m from each other in order to allow them to grow well and bear plenty of nuts. This feature restricts the intensification of coconut plantations within small areas [10]. This would be the main reason that the people dispersed throughout the islets. Concentrated settlements would have been intrinsically unsuitable for coral atolls where arable lands are extensively scattered.

Fig. 3.2.1. A muddy field of *puraka* in Tepuka, Tongareva

The people cultivate *Puraka* (*Cyrtosperma chamissonis*) in muddy fields which they probably constructed by modifying brackish inlets. Since Tongareva receives a small rainfall of only 1883 mm a year, such wet lands are easily influenced by salinity percolating into the water lens from the sea. This is likely the main reason there is no arable land for wet *taro* (*Colocasia esculenta*) in Tongareva Atoll.

Secondly, the structure of dwelling spaces can be determined from Lamont's descriptions. On the evening of the day when he was shipwrecked on Tongareva, he was taken by some people to a "hamlet" which was occupied by a family, and he observed:

an open space, strewed with white gravel from the sea beach, and planted round with

> young cocoanut trees, whose bright leaves completely shaded the three little huts that half occupied the space; while another, partially hidden by some pandanus trees, was evidently the cook house. [Lamont 1867: 116]

On the basis of this paragraph, Buck estimates that this extended family consisted of fifteen people including the head of family, a party of seven or eight men and women, and more than three children (Buck 1932a: 60-1). This family would be one of smallest communities in prehistoric Tongarevan society (see Section 3.3), which is equivalent to the social unit designated as a household, a household cluster, or a residential complex in settlement pattern studies in Polynesia (cf. Green 1986: 52).

In general, the physical components of the household unit which are identifiable in archaeological contexts are several houses and a cooking shed built in an open space. In addition, piles of coral fragments and discarded *Tridacna* sp. shells occur at the back of the cooking house. These would have served as reserves of heating materials to be used in the earth oven (Buck 1932a: 101). In support of this, I found several mounds of *Tridacna* sp. shells within the confines of TON-45 settlement on the islets of Mangarongaro (Fig. 3.2.2). While these mounds were, at first glance, similar to mounded ovens for turtle ceremonies, the 1995 excavation revealed that they contained no flecks of charcoal and no heat-shattered materials. As Buck's ethnographic account describes, two of them in site TON-45 are close to small curbed enclosures which would be foundations of cooking houses.

Household units also have other elements such as graves and well or water holes. In the case of TON-45 settlement, several graves occur somewhat distant from dwelling spaces, and close to a *marae*, although one of rectangular slab-lined graves is located nearby on the lagoonside of the settlement. An oval hole approximately 14 m in diameter, which is circumscribed with a wall of coral blocks, lies at the northern end of site TON-45 (Fig. 3.2.3). The hole is filled with muddy soil. Buck was taken to a water hole named Kitereau on the islet of Motukohiti, and described how water used to be collected from this hole in as many as twenty containers

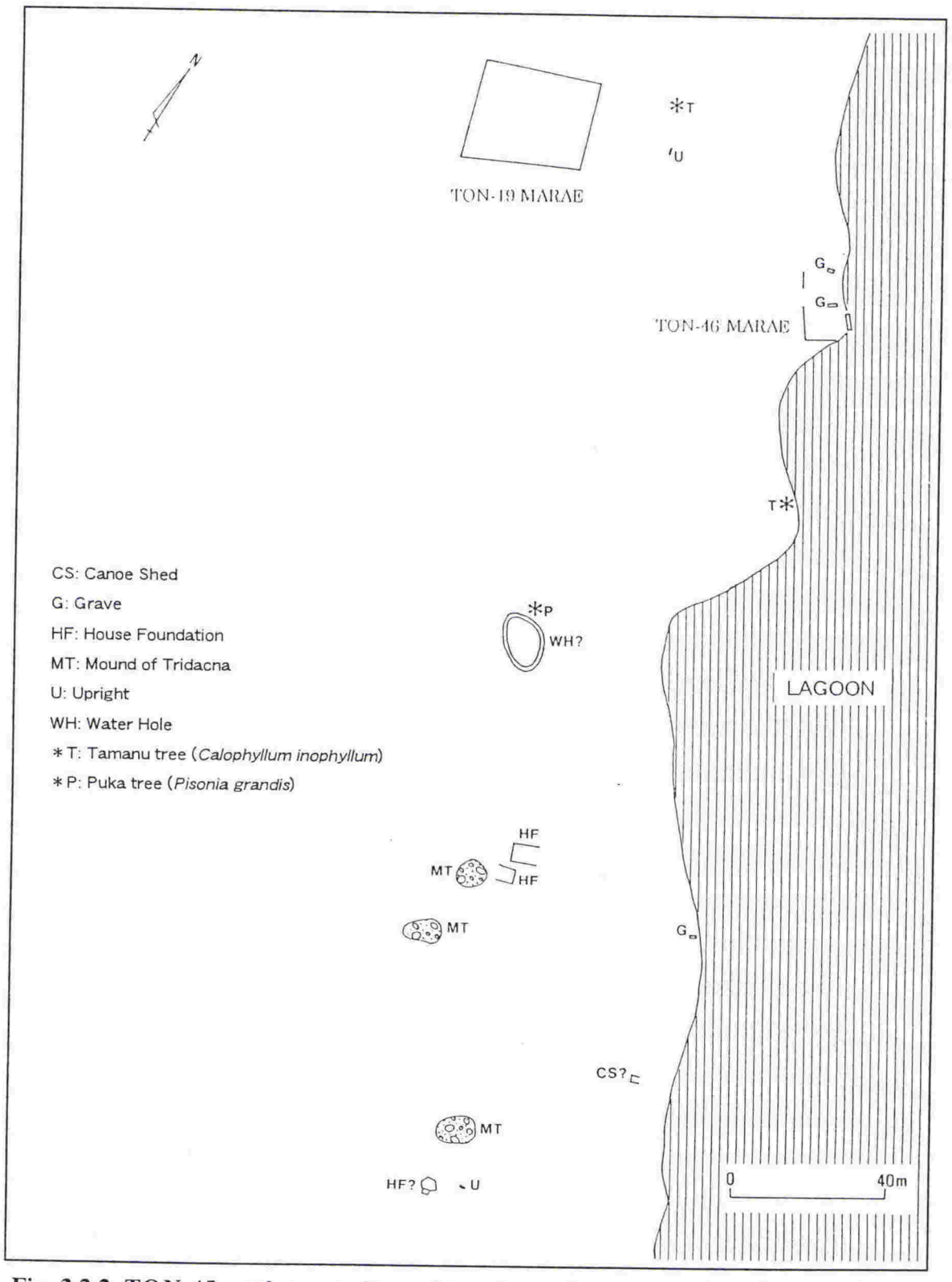

Fig. 3.2.2. TON-45 settlement site and locations of two *marae* (TON-19 and TON-46) in Mangarongaro

TON-45 settlement consists of two or three sections. Each of them is exhibited by a mound of Tridacna shells, a reserve of heating materials, adjacent to several house foundations which are enclosed by curbstones. Two *marae*, TON-19 and TON-46, lie in a coarse clump of coconut trees. Both *marae* are more than 160 m distant from the TON-45 settlement.

Fig. 3.2.3. A stone-walled structure in TON-45 settlement site in Mangarongaro, Tongareva

This large circular structure is enclosed with a wall of coral blocks. It is probably a well or a water hole for ceremonial bathing. The structure lies between two *marae* and the dwelling spaces of TON-45 settlement in the islet of Mangarongaro.

made from mature coconuts, which were carried on a pole (1932a: 102). There is no ethnographic account describing the walled structure on site TON-45 as a well, but Buck's description suggests that the Kitereau water hole was as large in size as this structure. Another possibility — which is also supported by Lamont description (1867: 175) — is that the walled structure was one of the water holes where men bathed to cleanse themselves after ceremonies performed at their *marae*. The stone-walled structure lies between dwelling spaces and two *marae* (TON-19 and TON-46), and it is thus plausible that the walled hole was used for ceremonial bathing as a structure ancillary to these *marae*.

Thirdly, Lamont stated that there were two sizes of household units. When he marched with the people to join a ceremony at a *marae* lying on the islet of Mangarongaro, in the western part of this atoll,, he observed the following:

> with a guard front and rear we were marched in the direction we had come the night previous [from the settlement where Lamont stayed]. From houses that we passed we picked up successively the mate, the second mate, and others, each with his particular guard; which whom, ere long, we arrived near the site of our wreck. In this, which happened to be the most thickly settled portion of the island, we found in one of the houses the doctor, captain, and one of the men. In a short time all the crew and the entire population of the island [of Mangarongaro] were congregated. We then continued our march [to a *marae*] ···. [Lamont 1867: 120]

The paragraph indicates that several small settlements were scattered as well as a larger and more thickly settled area existed on Mangarongaro. The smaller settlements would be equivalent to each unit of TON-45 settlement which consists of several house foundations along with a mound of *Tridacna* (Fig. 3.2.2). Judging from other paragraphs in Lamont's book, the thickly populated area was the settlement of a chief (*ariki*) named as Opaka. Since no one has yet found archaeological sites which can be identified as chiefs' settlements, the details of their physical components is still unclear. However, Lamont (1867: 229) wrote that the settlement of a chief's family on the islet of Atutahi contained a larger house and several smaller dwelling structures. This suggests that some of the chiefly household units in this atoll had more structures and were larger than common household units.

Among archaeological sites which have been excavated, TON-28/III settlement would be a possible candidate for a chiefs' household, as they are known from ethnographic accounts (Fig. 3.2.4). This site, located in approximately the middle of Mangarongaro, contains more than twenty rectangular structures enclosed with curbstones. These are assumed to be house foundations as well as those of cooking houses. Bellwood (1978:186) presumed that a good part of site TON-28/III may have been constructed

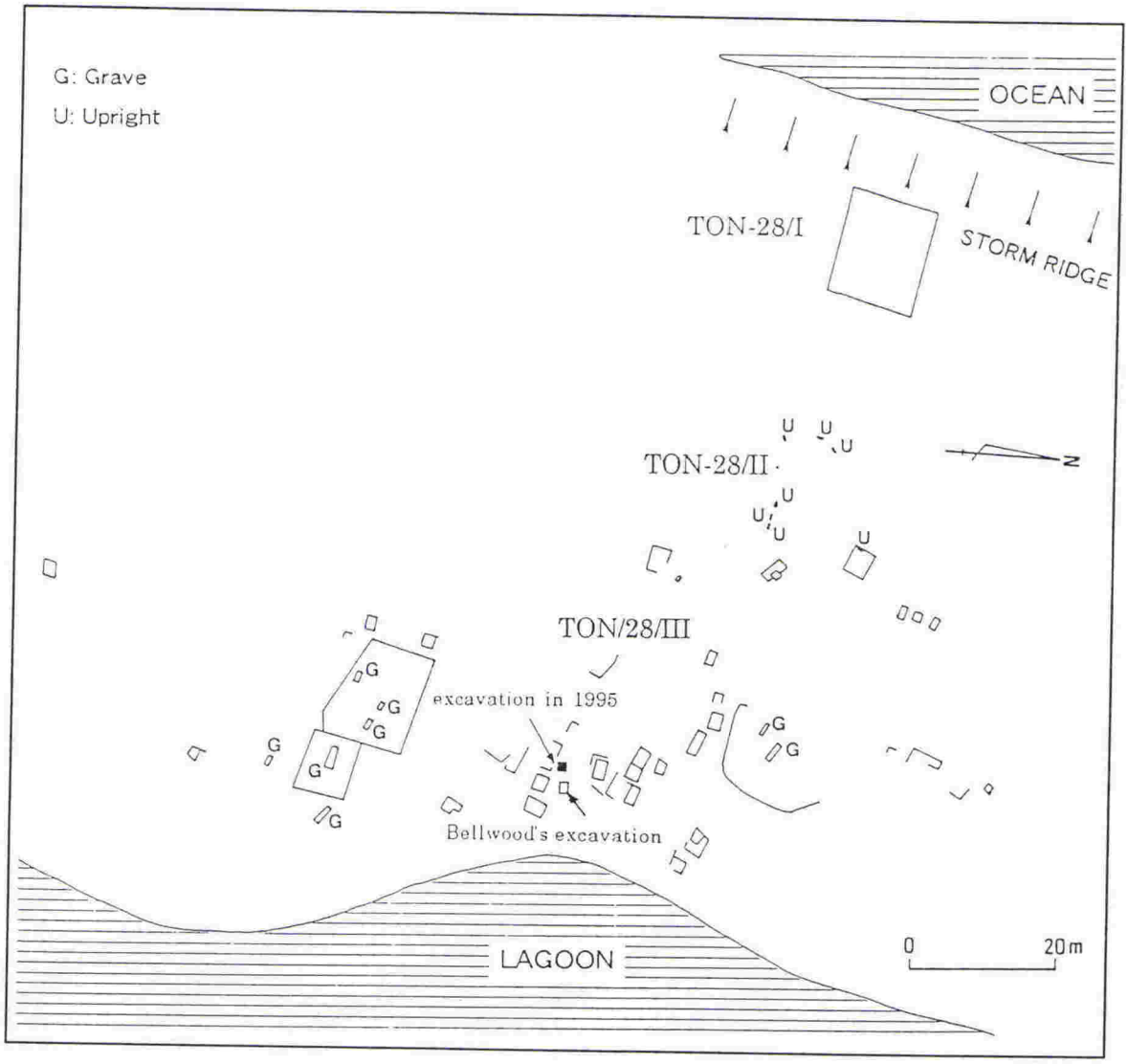

Fig. 3.2.4. TON-28 site complex in Mangarongaro, Tongareva

The diagram is modified after Bellwood (1978: Fig. 92). TON-28 site complex consists of a *marae* (TON-28/I), a circular courtyard (TON-28/II), and more than twenty house foundations enclosed with curbstones (TON-28/III). While Bellwood thought that a good part of the site might have been constructed during the early Christian period, this site is currently only one example which is inferred to be a chief's household unit spatially associated with *marae*.

after European contact, because of the existence of Christian graveyards. Two radiocarbon samples from excavations yielded dates from the late period of 200 ± 60 (NZ-1920) yr. BP and 270± 50 yr. BP (WK-4532) (see Appendix 2). These dates, however, are equivalent to the period of *marae* construction (see Table 3.1.1), and it is thus probable that the area of site TON-28/III was populated prior to European contact.

3.2.2. Spatial Separation of *Marae* from Household Units

Tongarevan household units were scattered on habitable islets, but every unit did not necessarily have its own rectangular *marae* or was spatially associated with any *marae*. Rather, *marae* would be related to higher social organizations; this topic will be discussed later in Section 3.3. When the people constructed *marae* in late prehistory, however, they might have considered the spatial association with specific settlements. In support, the people in Mangarongaro collected together in a densely settled area and then marched together to their *marae*, not directly from each household unit (Lamont 1867: 120). This ethnographic account suggests that the people recognized a spatial organization in which the *marae* was associated with a given household unit.

Lamont's description goes on to say:

> After a quarter of an hour's march [from the most thickly settled portion] we halted at a rugged and bleak spot. Blocks of coral rock were strewed around, and piled in masses of every form, as if rent and upheaved by an earthquake. The tall fara weed grew rank, showing that the spot was rarely visited. Numerous pandanus trees darkened more than usual the deep shade of the grove, but not enough to hide the tall stones of a "Mara" (or sacred ground) that appeared beyond. [Lamont 1867: 120]

As Bellwood (1978: 178) pointed out, *marae* — while forming the foci for settlement clusters in many parts of East Polynesia — are not necessarily close to dwelling spaces in Tongareva. Rather, most *marae* in this atoll are in secluded locations. For instance, TON-19 and TON-46 *marae* are separate from the TON-45 settlement (Fig. 3.2.2).

The spatial separation of *marae* from the dwelling space can be also observed in Hangarei. two archaeological sites occur on this islet: TON-21 rectangular *marae* and TON-47 settlement. The *marae*, lying on a storm ridge formed along the ocean beach, is approximately 200 m distant in a straight line from the settlement site. Other settlement sites have not been discovered,

even though I surveyed the entire islet in 1995. When Lamont visited Hangarei, he met an old priest called Monitu. Monitu took him to "a lonely little house, the only inhabited one" in the islet (Lamont 1867: 162). His description would seems to support my archaeological investigations.

Site TON-28 on Mangarongaro provides another good example of such a spatial arrangement of structures (Fig. 3.2.4). In this site house foundations (TON-28/III) are concentrated inland close to lagoon, and a rectangular *marae* (TON-28/I) lies separately on a storm ridge formed along the ocean beach. In addition, an arrangement of several coral uprights (TON-28/II), which appears to make up a circular or oval courtyard, occurs between the settlement area and the *marae* within site TON-28. There are no house foundations between the uprights and the *marae*.

Buck (1932a: 180) reported that several structures similar to site TON-28/II — although these definitely have a circular or oval court — occur on other islets: site TON-10/II in Naue and site TON-15/II in Atutahi. An arrangement of coral uprights on the islet of Kavea (TON-09/I) would be also classified as belonging to the same category, although the horizontal plan is anomalous (Yamaguchi 1995: 55). Of interest is the fact that all the above structures lie in the vicinity of rectangular *marae*. Taking this characteristic into account, along with a Lamont's observation that the women and children marching with him stopped short of the *marae* in Mangarongaro (Lamont 1867: 120-1), it suggests that these structures were gathering places on the way to or from *marae* (see also Buck 1932a: 181). Judging from their spatial relations to other structures, there is the possibility that these courtyards manifested the concept of a boundary between dwelling spaces and the sacred areas that are called *marae*.

3.2.3. Location of *Marae*

The above evidence suggests the possibility that the spatial separation

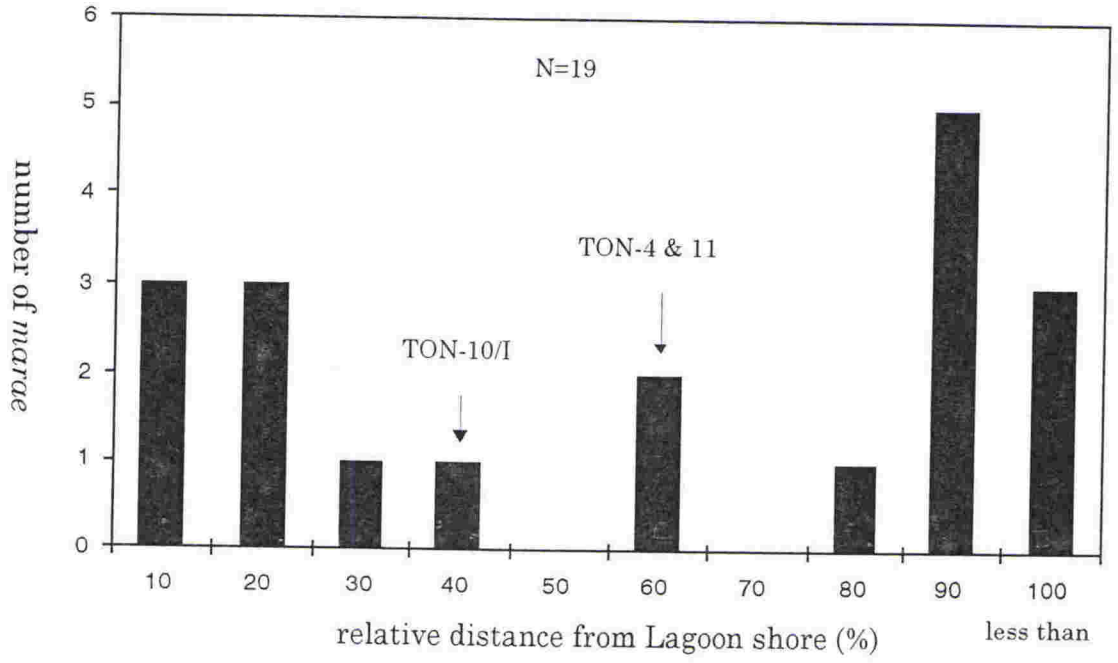

Fig. 3.2.5. Locations of Tongarevan *marae*

This diagram exhibits the relative positions of seventeen rectangular *marae* which are on larger islets. First, the relative distance of each *marae* from the lagoon shore was calculated as the land width was 100, and then the number of site falling into each class of distance was counted. As the diagram demonstrates, most of *marae* are close to the shore of ocean or lagoon.

of *marae* from dwelling spaces is inherent in the prehistoric settlement pattern. There are only three archaeological cases showing this separation definitely, those of Mangarongaro and Hangarei which provide us with a set of *marae* and dwelling structures. However, we can obtain circumstantial evidence by examining locations of other *marae*. In addition, this approach may lead to an interpretation of the meanings within this pattern.

Fig. 3.2.5 exhibits the relative locations of nineteen *marae* which are on larger islets. In this diagram I calculated the relative distance of each *marae* from the lagoon shore as a percentage, and then used the bar graph to show the number of sites falling into each class of distance. As the result of this analysis, it became evident that most *marae* — apart from the three sites falling into the range from 30 to less than 60 — were close to the ocean shore or the lagoon. Inland areas of the larger islets are densely covered with

Fig. 3.2.6. TON-09/II *marae* in Kavea, Tongareva

This *marae* lies in open space where *Pandanus tectorius* is predominant. The ocean reef is on the other side of Pandanus trees at the back of the photo. The photo shows taller uprights standing along the rear of the court and the interior stone arrangements which are typical features of Type A *marae*.

uniform forests of coconut trees reaching 20 - 30 m in height, but the margins of islets, in particular those oceanside, are more open and occupied by subcanopy species of less than 5 m in height such as *Pandanus tectorius* and *Morinda citrifolia*. Shrubs of *Scaevola taccada*, *Pemphis acidula* and *Tournefortia argentea* are predominant over the more marginal strand areas. Interestingly, all the oceanside *marae* lie in the open spaces occupied by these subcanopy and shrub species (for instance, see Fig. 3.2.6).

Even the three exceptional *marae* — TON-04, TON-10/I and TON-11 — which are positioned in the middle of Fig. 3.2.5 are also located in open spaces outside clumps of coconut trees. TON-10/I and TON-11 *marae* on the islet of Naue are close to a large, brackish inlet separating the mainland from the

Fig. 3.2.7. TON-10/I *marae* in Naue, Tongareva

TON-10/I *marae* lies in open space which surrounds a brackish inlet. Shrubs of *Pemphis acidula* are predominant there. The photo shows uprights standing along the rear of the court. The large inlet begins beyond the uprights.

storm ridge extending along the ocean beach. TON-04 *marae* on the islet of Ruahara lies adjacent to an small inlet. Brackish inlets are usually surrounded by open spaces where subcanopy species and shrubs are dominant, and the above three *marae* are in just such a landscape (for instance, see Fig. 3.2.7).

The above observation is, however, made on the present vegetation. Other approaches are thus necessary for reconstructing the vegetation at the time of *marae* construction. In 1995 I had the opportunity to excavate five *marae*: three of them on the oceanside and two on the lagoonside. The excavations revealed that flecks of charcoal were scattered over layers related to the construction periods of these *marae*. This indicates that the selected places

Table 3.2.1. Identified plant species from charcoal samples from excavated *marae* (1)

spices or type	local name	average height	habitat	TON-SITE (marae) NO.				
				lagoon side		ocean side		
				19	20	21	28	33
Pemphis acidula	Ngangie	2-4 m	foreshore - beach ridge			X	X	
Scaevola frutesches	Ngasu	1-3 m	backshore - beach ridge					
Messerschmidia argentea	Tausunu	3-5 m	backshore - beach ridge					
Morinda citrifolia	Nenu	3-5 m	beach ridge - back slope					
Monocotyledon				X	X		X	X
Pandanus tectorius	Hara	3-5 m	beachridge-back slope					
Cocos nucifera	Niu	20-25 m	back slope of ridge - inland					
Guettarda speciosa	Hano	18 m	inland					
Cordia subcordata	Tou	15-25 m	inland					
Calophyllum inophyllum	Tamanu	20 m	inland					
Pisonia inermis	Puka	25 m	inland					

(1) The species were identified by Dr. Rod T. Wallace, Anthropology Department, the University of Auckland.

were cleared and burnt prior to *marae* construction, and thus identifying plant species from charcoal samples will provide direct evidence of the past vegetation. The results are presented in Table 3.2.1. Charred flecks of *Pemphis acidula* — a typical shrub species growing thickly on shore areas — were retrieved from two *marae* on the oceanside (TON-21 and TON-28/I). This illustrates that open spaces covered with shrubs were selected for the construction of the above two *marae*, as the present vegetation suggested.

Charred flecks collected in three other *marae* — TON-19, TON-20/II and TON-33 — are derived from Monocotyledon plants. Monocotyledon plants present on this atoll are *Pandanus tectorius* and *Cocos nucifera*. If the samples are from Pandanus, we can infer that these three *marae* were constructed in open spaces around clumps of coconut trees, like TON-09/II *marae* currently surrounded by Pandanus trees (see Fig. 3.2.6). However, it is difficult to identify charcoal samples of Monocotyledon plants to species level.

In addition to this problem, the charcoal samples are small as a result of having been collected from small excavations. Thus, another method to obtain information on the past vegetation will be needed. To this end, examining the soil sedimentation of excavated sites can be used as a subsidiary method. Keio University and myself have excavated eight sites including the above five *marae* and three settlement sites (TON-28/III, TON-40, and TON-41). There were no house foundations on the sites of TON-40 and TON-41. So strictly speaking, these two sites are not prehistoric dwelling areas. However, various paraphernalia, — for instance, pearl shell fishhooks, coconut scrapers, and adzes of Cassis shell and Tridacna shell — were retrieved from the excavations (Yamaguchi 1995: Table 5). Therefore, it is possible to view TON-40 and TON-41 as sites of daily activities which are closely associated with dwelling spaces.

Fig. 3.2.8 exhibits schematically the profile of the sediments at each of the eight sites. As can be seen in this diagram, there is a marked tendency for humic soils, including surface and brownish black soils, to accumulate around the three settlement sites. The thickness of these soils is over 30 cm, and in particular, more than 50 cm at the sites of TON-40 and TON-41. In contrast, humic soils are thinner around *marae*, irrespective whether they lie oceanside or lagoonside. Notably at TON-20 *marae* brownish gray sand containing little humic materials lay just beneath the platform. The humic soil of site TON-28/III is somewhat thinner than those of other settlement sites, but it is thicker than that of TON-28/I *marae* which is adjacent to this settlement site.

It is legitimate to consider whether the marked amount of humic soil has originated from the organic matters of coconut trees in the atoll of Tongareva, where this species accounts for about 90 percent of total vegetation (Linton 1933). Following this consideration, the sedimentary conditions at the above eight sites indicate that the Tongarevan *marae* were constructed in places which were unsuitable for growth of coconut trees, and they are spatially separated from any dwelling spaces which were normally established within

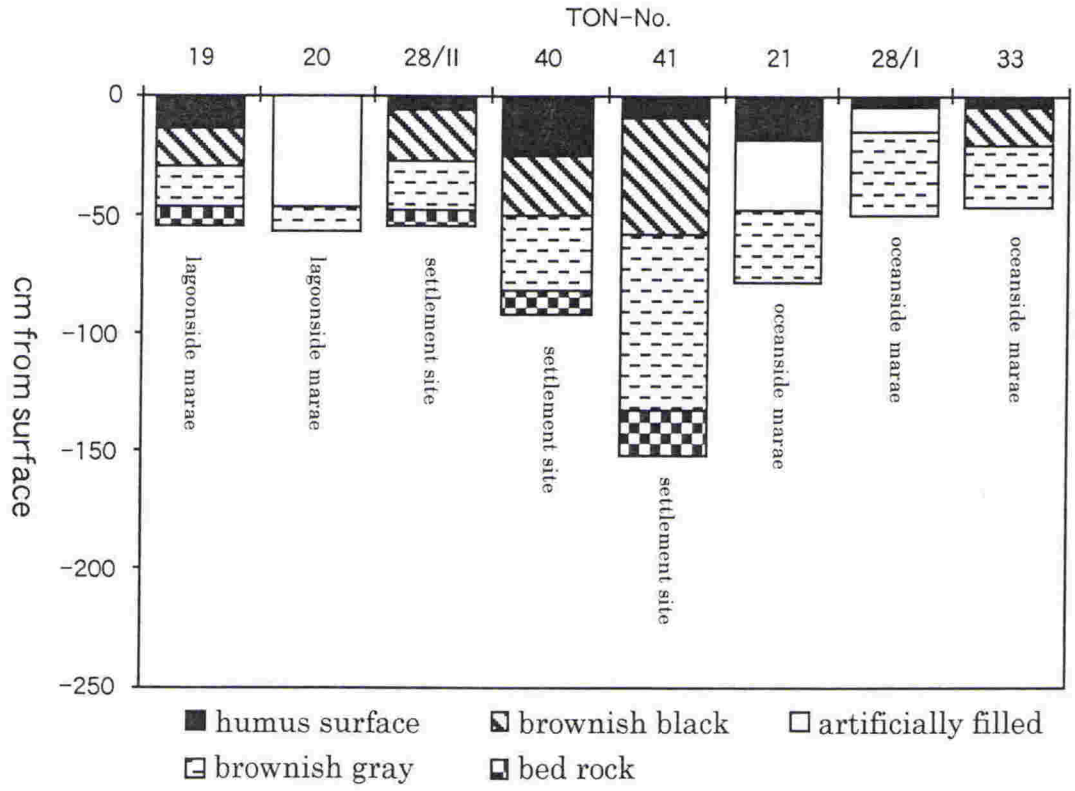

Fig. 3.2.8. Soil sedimentation profiles of excavated sites in Tongareva

Keio University and I carried out small excavations at eight sites including five *marae* and three settlement sites. This schematic diagram exhibits the tendency that humic soil is more thickly accumulated in settlement sites than in *marae* locations.

the clumps of coconut trees.

3.2.4. Meanings Encoded in Spatial Separation of *Marae* from Settlements

Several household units, probably those of chiefs' families, are spatially associated with *marae*. This association, however, does not indicate spatial centrality of *marae* within the confines of a specific settlement but its spatial separation from the settlement. In addition, the difference of vegetation enhances the impression of the spatial separation between *marae* and settlements, as does their physical distance. While settlement sites usually

lie within clumps of coconut trees, most *marae* are, on the contrary, located outside suitable lands for aboriculture.

As already noted at the beginning of Section 3.2, coconut trees were an essential resource on Tongareva. Coconut trees supplied the people with most of the necessities for their subsistence, and the clumps also provided shade. It is not strange therefore that the people established their dwelling spaces in such clumps. This explanation is, however, followed by the next question: why did the people construct their ceremonial structures in secluded places where subcanopy species and shrubs were predominant, and what meanings were encoded in the locations of *marae*? While the available archaeological data demonstrate the pattern of spatial separation between dwelling spaces and ceremonial ones, they do not provide the specific meanings encoded in this pattern. However, if it is possible to consider these meanings by going beyond the archaeological data, we can infer at least three possibilities.

The first one is materialistic or economic. The largest *marae* (TON-25) is approximately 1600 m^2 in area, and the average area of *marae* is 740 m^2. If the people plant a coconut tree at each corner of 10 meter squares, they would have to cut down 25 trees to build a largest *marae* (which hypothetically ocupy a squared area of 40 m x 40 m) within the clump. While there is no ethnographic account on how many trees a person needed to subsist on, we know a fair amount about coconut trees. Coconut trees rarely bear fruit until they are six or seven years old, and from then each tree produces about 60 nuts per year for approximately 60 years (Sato 1983). Cutting down 25 trees is equivalent at least to the loss of 9,000 nuts (60 nuts x 6 years x 25 trees), even if the people immediately plant the same number of substitute trees in the other area. Seen in this light, it is convincing to infer that a materialistic meaning was encoded in the spatial separation of *marae* from dwelling spaces, that is a binary opposition between economic value and worthlessness [11]. As a result of this, the people may have selected the sterile, open lands for the construction of their *marae*.

The second possibility is a more social meaning related to Tongarevan land tenure, or the right to coconut trees. Higher ranking chiefs were not land distributors in Tongareva. Rather, each household unit controlled the land for cultivation of coconut trees. An ethnographic account indicates that the preservation of coconut trees (*masanga*) was often an individual affair and affected only the trees of a family (e.g. Goldman 1970: 72). An account of plantation activities also supports an individual's or an extended family's right to land. "The man who planted a coconut on land where he occupied had the right to its fruit when it grew up. Thus, individual ownership of the land and the coconuts which grew upon it went together. The planting of coconuts, if allowed to go unchallenged, established the right to land even without occupation" (Buck 1932a: 58). In addition, "the intimate link between an individual and his or her soil was demonstrated by a ceremony in which the placenta was buried and a coconut planted above it" (Campbell 1985: 60). Clumps of coconut trees, or suitable lands for plantation, were divided into many small sections, at least in late prehistory when most of rectangular *marae* were constructed. It is therefore inferred that such conditions would force the people to select secluded places, where coconut trees did not grew well and thus which might be more communal properties, for the construction of their *marae*.

The last possibility is an ideological or a religious meaning. The separation may be also interpreted as an ideological distinction between spaces for daily activities and for ceremonial ones. Lamont notes the fear or awe of *marae* which the people showed when they performed a ceremony, as below:

> The women and children, who are not allowed to enter these holy precincts, now stopped with looks of fear, whilst all men proceeded a few paces farther. ··· I saw that all were serious, some blanched with fear. Four young men rushed with their spears to the edge of the [*marae*], as if about to attack an enemy; and facing each other with the most horrid contortions of visage, rapidly uttered or rather yelled a kind of incantation, to frighten away the evil spirits that always haunt these spots; and such faces were surely enough to frighten spirits or mortals either. When this "hai-ing," as it is called,

> was concluded, the whole concourse of men hastened within the precincts of the [*marae*], as if afraid that the wicked spirits might get in before them. [Lamont 1867: 120-1]

While this description would include Lamont's own impressions, it is tempting to see the participants in the ceremony as spirit-fearing people who viewed *marae* and its vicinity as related to supernatural or spiritual beings [12]. When Mr. David Mahera — one of my informants — told me about lands called as "*tahua*," he described them as very white and very long lands. These characteristics are in keeping with the landscape of the sterile backshores which are covered with white coral gravel or boulders and have extensive views because of the dominance of low shrubs. While *tahua* generally refers to assembly grounds or platforms in Polynesia (Green 1986: 53-4; Eddows 1991: 198), this term in the Rarotongan language means cleared spaces where many tribal ceremonies or rituals are performed (Savage 1962: 142). The term of *tahua* is applied on Tongareva to the sterile, open lands where most of *marae* were constructed. This raises the possibility that the people recognized such a sterile landscape as exhibiting sacredness and that their *marae* were visible symbols representing the concept of separation of sacred spaces from secular areas covered with coconut trees, although my informants provided no information indicating any relationship between *tahua* and sacredness [13].

I have discussed three possible meanings for the separation of living areas from *marae* in this section. Each of them can be viewed as concepts in binary opposition: economic value and worthlessness in the sphere of subsistence, individuality and community in the social sphere, and profaneness (daily activities) and sacredness (ceremonial activities) in the ideological sphere. Each set was derived from the contrasting landscapes and vegetation patterns of this atoll which range from clumps of coconut trees to open spaces where the subcanopy and shrub species are predominant. Again, while we can not approach such meanings directly from the archaeological evidence, it is possible to infer that the above meanings were taken into account during *marae* construction if we have other relevant — botanical, topographic, and ethnographic — data. It is not evident whether all the above

meanings were encoded in every *marae*, but we should not discount the possibility that *marae* were richly polysemic, architectural symbols. As such, they would exhibit a variety of meanings including others which have not been considered in this section.

3.3. *Marae* as Territorial Markers of Districts — Meanings at the Level of Districts —

In the preceding section (Section 3.2), the secluded location of Tongarevan *marae* was set out from archaeological data, and three possible meanings encoded in this choice of location were discussed. However, sterile locations are not limited to small areas, but extend along the coast line of many islets. This fact leads us to question why the people selected a given place for each *marae*. There may be other reasons than the three meanings discussed above.

One of these meanings may be the symbolic aspect of *marae* as territorial markers. The linkage of East Polynesian ceremonial architecture with territoriality has been frequently discussed. For instance, Emory noted the following:

> The *maraes* [in the Tuamotu Archipelago], as the property of the kindred, were material symbols of them, and formed a visible connection with the past. Always standing on the land occupied by the kindred, observable by any who might pass, they came to be a seal of ownership. They bound the ancestral spirits and gods of the kindred to the land, putting it under their eternal guardianship. [Emory 1947: 20]

This description indicates that one of main roles of the Tuamotuan *marae* was to symbolize the territorial claim of descent groups. Renfrew (1984: 80) quotes this paragraph to the effect that megalithic monuments such as Tuamotuan *marae* served as territorial markers. Valeri (1985: 186) also refers to similar aspects of several Hawaiian temples [14]. However, these

descriptions are not derived from an examination of actual locations and distributions of ceremonial structures, but are general explanations. Therefore, I will try to assess the likelihood that Tongarevan *marae* served as territorial markers, by scrutinizing their spatial linkage with socio-political territories. To do this, it is necessary to determine which socio-political level the *marae* are related to.

3.3.1. Reconstruction of the Tongarevan Socio-Political System

What level of social group was related to Tongarevan *marae*? Lamont visited many islets during his stay in this atoll, and was included in several social groups as a high-ranking member through ceremonies which the chiefs known as *ariki* performed at their *marae*. Each of these groups — Buck (1932a: *passim*) referred to them as "districts", expressing the territorial aspect — would maintain its own *marae*. In order to comprehend characteristics of districts, however, the discussion should begin with a reconstruction of the socio-political system. Goldman (1970: 73-4) divided the Tongarevan socio-political system into four levels:

Level 1. This is the lowest level consisting of patrilineal extended households termed *haanau*, which were the smallest social units in Tongareva. Each household, including up to four generations of patrilineal members, was a primary land and coconut tree holder, and so formed an economic and residential unit (Campbell 1985: 52). It was for most purposes economically self-sufficient and independent, reallocating their holdings from generation to generation in order of seniority;

Level 2. Each community of this level consisted of a set of *haanau* tracing the descent from a common ancestor. It was headed by a lower-ranking *hono tagata* or lesser chief. Since the groups were incorporated into the larger groups of level 3, they can be also viewed to have been subordinate social units. Each *hono tagata* bound the extended families to a larger group on the basis of a genealogy, and enabled the whole district (Level 3) to act together under the senior chief (*ariki*) of the larger group so formed (Buck 1932a: 45). O Pai Tangata who adopted Lamont would be one of *hono tagata* who headed a sub-district of Mangarongaro (Buck 1932a: 49);

Level 3. This is the level of the largest social groups (local districts) which were politically stable to some degree. Some of these groups encapsulated subordinate units, as described above. Each group included members acknowledging descent from a common ancestor, and was headed by an *ariki* or a chief of the senior line. The group appears to have been politically autonomous especially in peace time. Such groups correspond in structure to what is now known as the *huaanga*, although it is unclear whether the term was used when Lamont visited Tongareva (Campbell 1985: 52);

Level 4. This level is a "conquest state" representing the entire atoll, or a federation forming a large division. Lamont (1867: 126) noted, "The various inhabited islands are in a constant state of feud with each other, though alliances are sometimes formed for mutual protection." Such alliances would create larger polities than local districts. A genealogical tradition (Buck 1932a: 50) describes that the entire atoll was under a single *ariki* — called Turua — at one period. He declared himself at the head of the entire atoll and claimed the turtle tribute, probably on the basis of his genealogical superiority to other higher ranking chiefs. Such a political integration would not, however, have lasted long, as this tradition tells later, "in the period of Maiveriki, the turtle tribute was not exacted, and each chief or individual was entitled to keep what he caught" (Buck 1932a: 50). It is thus supposed that any political levels beyond local districts were unstable or temporal.

However, the above levels give a somewhat incorrect impression that the status system of autonomous districts consisted of three stratified ranks: *ariki*, *hono tangata*, and *haanau* (Fig. 3.3.1). It is doubtful that these ranks were firmly stratified, and that only the *ariki* possessed the privilege of establishing their districts. We must consider the possibility that the domination of the Tongarevan *ariki* was quite restricted. They were neither land distributors nor redistributors of resources, although the *ariki* headed larger and richer household units in terms of subsistence economy. Status differentiation would be actualized in political alliances when conflicts occurred between districts. However, the consequent victories did not increase the economic superiority of an *ariki*, since the victory resulted not in the expansion of territory but in the plunder of coconuts. Thus, it can be seen that ordinarily the traditional status system was comprised of several graded ranks.

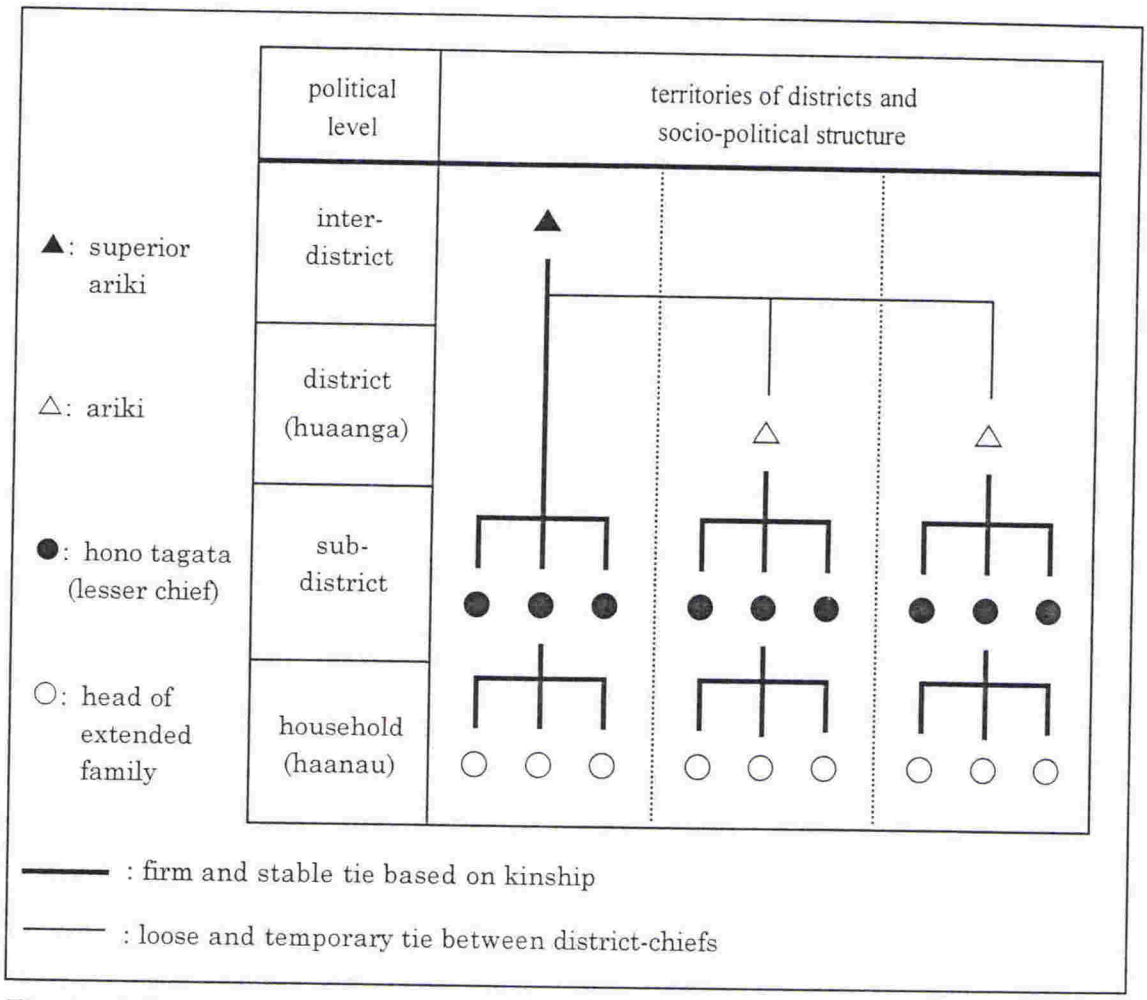

Fig. 3.3.1. First reconstruction of Tongarevan socio-political system

On the basis of analytical levels described by Goldman (1970) the Tongarevan socio-political system can be reconstructed as well-stratified, but it is somewhat inaccurate as discussed later (see Fig. 3.3.2).

In order to clarify the above issues, it is necessary to consider the process of social segmentation. Buck generalized it as such:

> In the settlement of the various islands and island divisions the territorial groups were derived from families which had hived off from the main lines at various periods, and though all were related through common ancestors, certain territorial groups with pedigree links more recent showed closer relationships than others. In two or more related territories the senior family was known, and the senior chief of one of the linked territories was also, by descent, the senior chief of the combined territories. [Buck 1932a: 45]

This explanation enables us to reconstruct the following process of social segmentation as a hypothetical series of phases. In Phase I, small social groups migrated from several other islands to Tongareva. They established their settlements separately on the large, fertile islets of this atoll. To support this, the present inhabitants claim descent from one of three main lines of founding ancestors: Takatu, Taruia and Mahuta. This suggests migration from several islands. Oral traditions state that Taruia came from Aitutaki, an island in the Southern Cook Group, and that Mahuta came from Rakahanga — an atoll in the Northern Cook Group — via Tahiti (Buck 1932a: 17).

In Phase II, population growth gradually led to the branching out of the initial groups. Junior collateral lines established new groups on other islets. An intriguing tradition of Taruia, one of founding ancestors, relates to early segmentation of the social groups. Taruia left Tongareva shortly after his arrival on the islet of Tokerau, but he left two men: one of them settled at Tokerau and another one moved to another islet named Omoka (Buck 1932a: 17). Tongareva Atoll is called Mangarongaro in the Aitutakian version of the Taruia tradition (Buck 1932a: 17). Mangarongaro is the name of a southwestern islet in Tongareva, and the islet would thus be occupied by a social group which also branched from the Taruia line. Such social segmentation, which led to exploration of uninhabited islets distant from the original settlement, likely promoted the establishment of new *ariki* titles and the formation of autonomous local districts.

The most habitable islets were settled by Phase III. In this situation, junior collateral families tended to branch out from the senior family, since a dispersed settlement pattern within the confines of an islet naturally leads to social segmentation. Buck suggested, however, that closer relations between senior and junior families was maintained within the "district" in some degree. This feature would lead to the intricate aspects of the Tongarevan socio-political system. In short, it is ambiguous whether the social segmentation occurring during this later phase was accompanied with

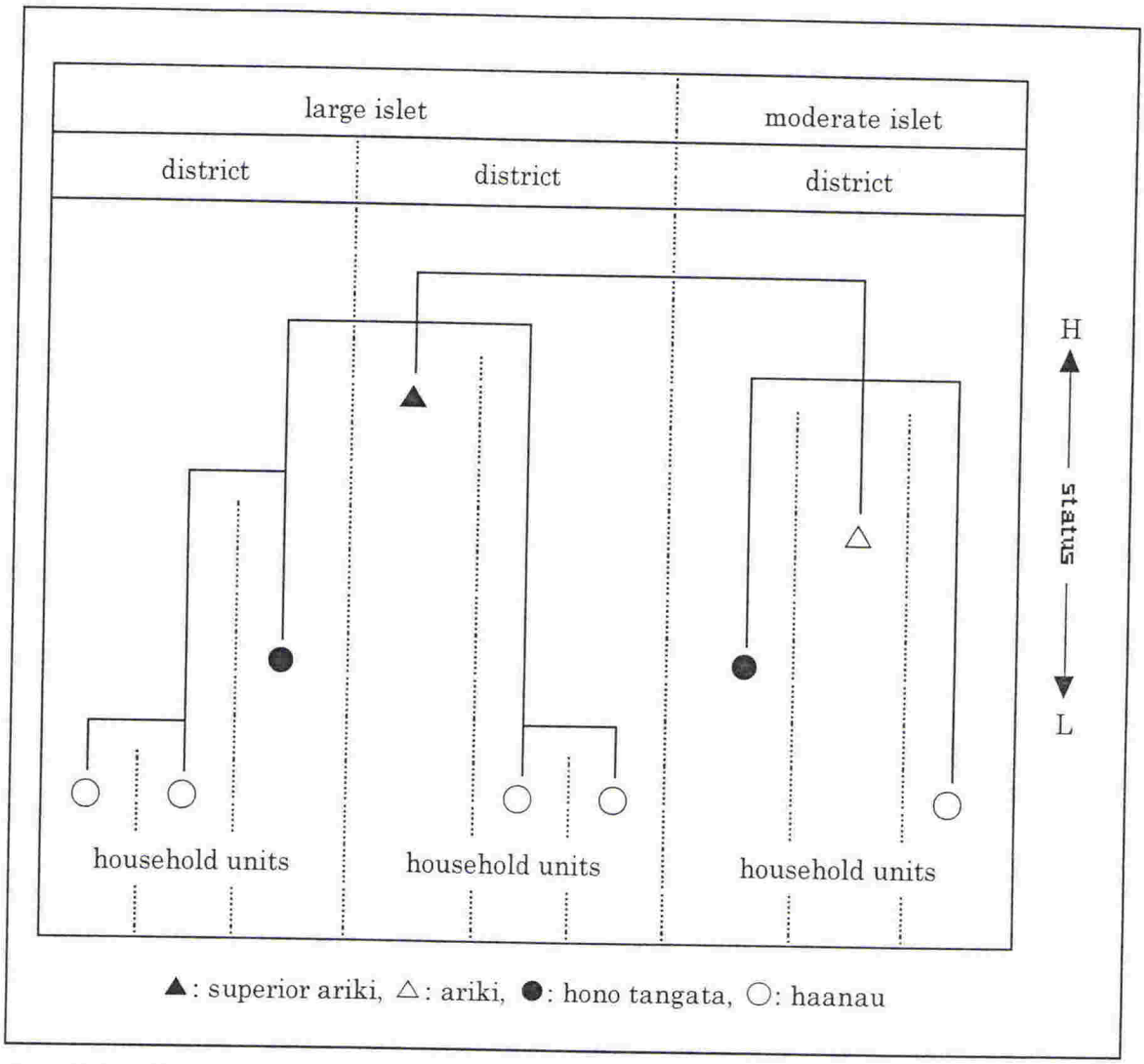

Fig. 3.3.2. Revised model of the Tongarevan socio-political system

Several ethnographic accounts indicate that Tongarevan socio-political system was not based on any firm differentiation among political ranks, but on the gradation of ranks. In such a system, there would be some districts (*huaanga*) headed by chiefs who had no titles of *ariki* but those of *hono tangata* (lesser chiefs). Viewed from the economic aspects, these *ariki* and *hono tangata* were also only the heads of household units.

establishment of new *ariki* who controlled the autonomous districts.

We may therefore need to revise the model of the Tongarevan socio-political system (see Fig. 3.3.2). It is plausible that the socio-political segmentation in Phase III promoted the establishment of the lower rank termed *hono tangata*. Some chiefs holding this title may have kept on being

politically involved in the district which they belonged to, but some others could have established new districts if their original district had enough space to divide the territory among them. The districts formed in Phase I and II would have been largely autonomous and self-sustaining. Thus, later social segmentation which occurred within these districts would be also unique as a result of the specific circumstance of each district.

3.3.2. Reconstruction of Districts

The Tongarevan socio-political system is equivalent to the segmentary societies which Renfrew defines in his work. He enumerates the two criteria which characterize a segmentary society: (1) the society is composed of permanently functioning small groups, and (2) the groups are not subordinate parts of an effective and larger political and economic entity whose hierarchical control diminishes the autonomy of its constituent parts (Renfrew 1984: 177). He also points out that in many segmentary societies the territories of such small groups are given symbolic expression (Renfrew 1984: 178), and that the monuments — originally constructed as burials, ancestral resting places and so forth — are central to that symbolic expression of territory (Renfrew 1984: 175). In the case of Tongarevan society, local districts (*huaanga*) would correspond to the small groups which Renfrew describes, and the *marae* would be the monuments which symbolically express their territories.

Lamont's book includes thirteen names of districts (Lamont 1867: *passim*), but there are twenty-three archaeologically recorded *marae*. Thus, first, it appears that *marae* did not correspond to districts. However, if the formation of districts was flexible as discussed in the preceding section, it is possible to conclude that various configurations of districts have occurred in the past and thus not described by Lamont.

In order to examine the association of the *marae* with the territories of

districts, it is necessary to reconstruct these unknown districts accurately. Of course, in this we can not depend on the distribution of *marae*. The reconstruction must be based on other data without reference to *marae* in order to avoid a circular argument.

During the 1989 expedition of Keio University, I had the opportunity to obtain information on the lagoon divisions known as *huaanga moana* (Fig. 3.3.3). These divisions are bounded by lines drawn between coral pinnacles [15], and every division is bordered by the landform which surrounds this lagoon. Many names of divisions are identical with those of districts given by Lamont (Table 3.3.1), and it is thus highly likely that the divisions of the lagoon were closely related to the land territories of districts (*huaanga henua*).

However, there are discrepancies between both Lamont's information and mine. Several district names given by Lamont are not found in the list of lagoon divisions, and vice versa. This indicates that both sources are incomplete, and it is necessary to ask why such discrepancies may occur. Linton's map, published in 1931, is applicable in addressing this issue [16]. It gives us many land division names, so we know the approximate location of the districts which Lamont described. By comparing the three sources five possibilities for the discrepancies suggest themselves:

(1) Lamont did not visit or describe all the districts. For instance, Tausoata / Rukutia, Hanoa and Rupu which are found on the list of lagoon divisions are in this category;

(2) There were no districts on several small islets, although they were associated with divisions of the lagoon. For instance, southernmost islets, which fall into the range of the two lagoon divisions of Moturakinga and Vaiari, are not suitable for human settlement, because of the scarcity of coconut trees. Rather, such small islets would be held as satellite territories by districts occupying larger islets;

(3) There was a political buffer or neutral zone unoccupied between two districts. This is the case with the land facing on to the lagoon division of Tautupae, between the Omoka and Motukohiti districts which are located on the northwestern islet. Lamont also observed

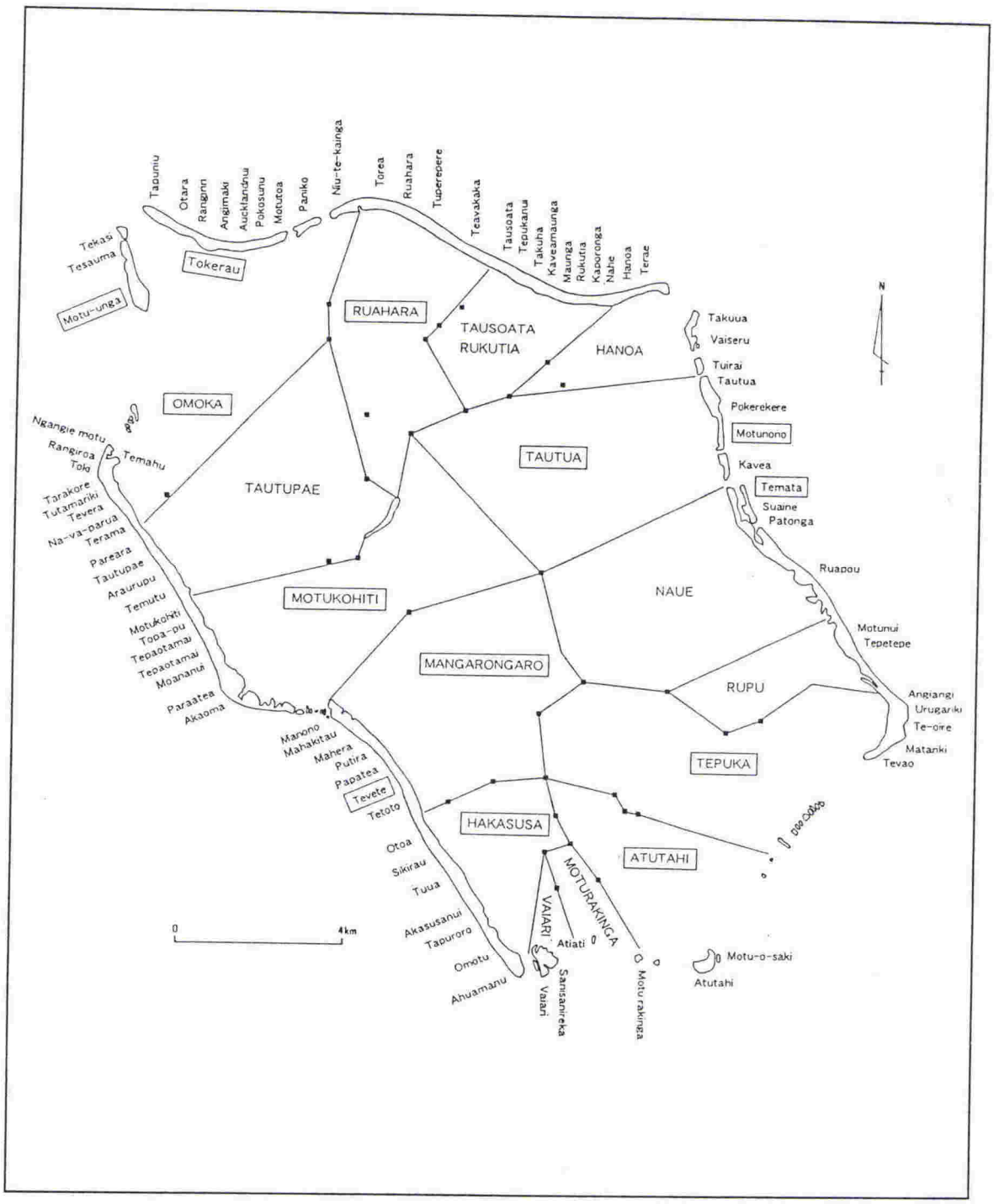

Fig. 3.3.3. Divisions of lagoons (*huaanga moana*) in Tongareva Atoll

During the 1989 expedition of Keio University, I had the opportunity to collect information on fifteen divisions of the lagoon. These divisions were termed *huaanga moana*. Land names shown outside islets are taken from Linton's map which was published for the Cook Island Administration in 1931. The boxed names are identical with the district names noted by Lamont.

Table 3.3.1. Names of local districts and divisions of the lagoon of Tongareva (1)

Lagoon Divisions (*huaanga moana*)	Districts (*huaanga*) given by Lamont
Omoka	Omoka
	Motu-Unga
	Tokerau
Ruahara	Ruahara
Tausoata / Rukutia	
Hanoa	
Tautua	Tautua
	Motunono
Naue	Temata
Rupu	
Tepuka	Tepuka
Atutahi	Atutahi
Motu-Rakinga	
Vaiari	
Hakasusa	Hakasusa
Mangarongaro	Mangarongaro
	Tevete
Motukohiti	Motukohiti
Tautupae	

(1) The names of the districts are listed in a clockwise direction from Omoka, the northwestern islet of the Tongareva atoll.

rugged rocky ground destitute of coconut trees between these two districts (Lamont 1867: 169). During his stay, Motukohiti was subject to oppression from its militant neighbour Omoka (Lamont 1867: 169-70). Of interest is that the unique human-shaped monument called Te Papa-o-sokoau (TON-23) lies on the land division of Tautupae (Fig. 3.3.4). This structure is said to have been a place of refuge where a person was immune from an enemy's attack (Buck 1932a: 176). This information supports the possibility that the land division of Tautupae was a buffer zone between the above districts which were antagonistic;

(4) A division of lagoon was associated with two or more districts. The lagoon division of Omoka comes into this category. It was divided into three parts, each belonging to Omoka, Motu-Unga and Tokerau districts;

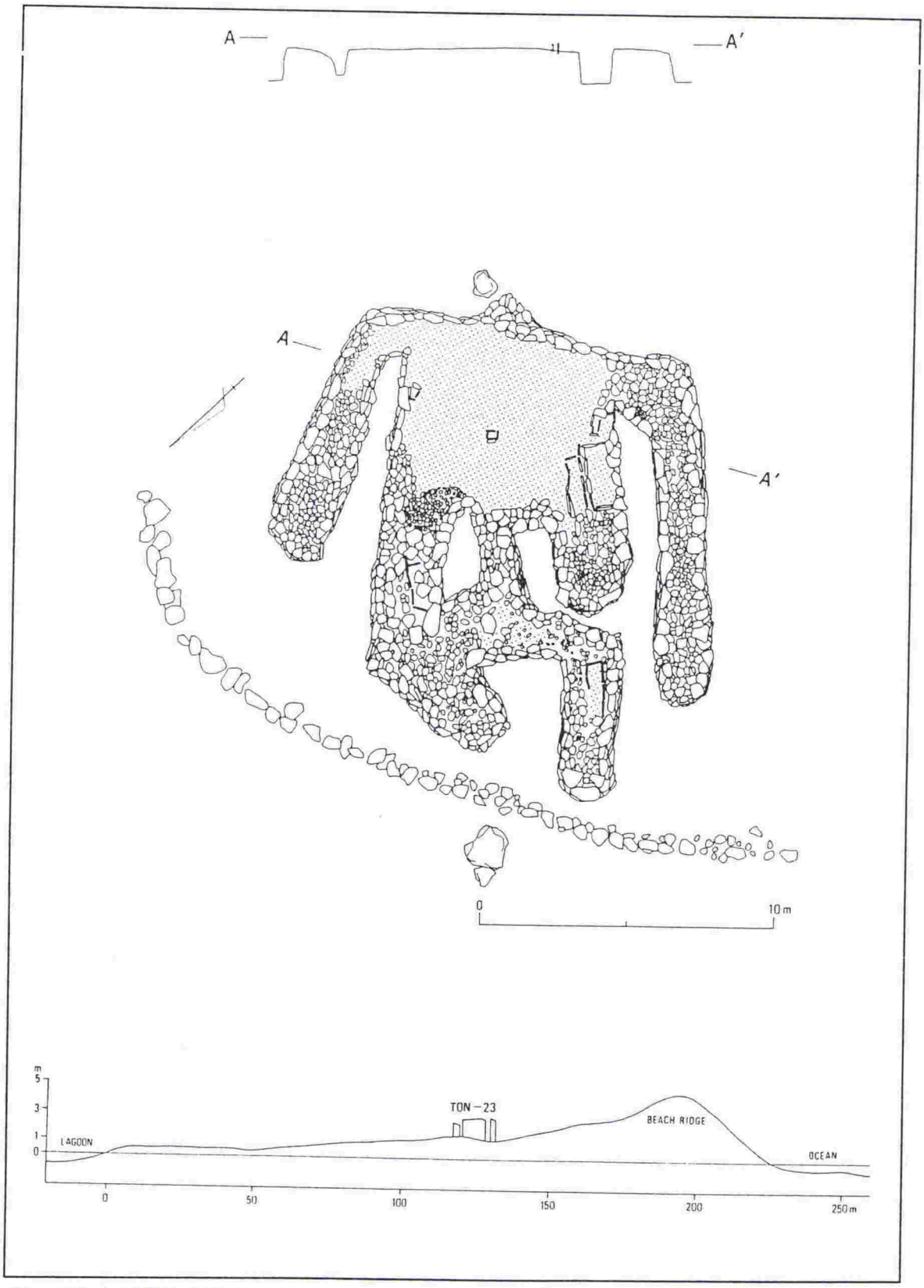

Fig. 3.3.4. TON-23 human-shaped monument in Tautupae, Tongareva

As Bellwood (1978: 173) states, this monument is a unique site in Polynesia, and belongs to the "esoteric domain of culture" (Sahlins 1955). While this site is associated with a revenge tradition, an informant of Buck stated that it was a refuge where any person who committed a crime was immune from attack (Buck 1932a: 176).

(5) More than two districts shared a division of the lagoon: for instance, Tautua and Motunono, Mangarongaro and Tevete, Temata and Naue, and probably Hakasusa (Hakasusanui) and Tapuroro. Mr. David Mahera — one of my informants — provided much useful information on this subject. According to him, there were two chiefs in the islet of Naue, one of them occupied Temata and the other Patanga. He told me that they shared a division of the lagoon since they were genealogically close to one another. He also stated that there had been two chiefs in each district of Mangarongaro and Hakasusa, one of the Mangarongaro chiefs occupied Tetoto and the other Mahera; one of the Hakasusa chiefs occupied Hakasusanui and the other Tapuroro.

While all these possibilities could be factors in causing the discrepancies between Lamont's information and the lagoon divisions, the last one needs a little more explanation since these pairs of districts could be examples of social segmentation in later prehistory. It is not evident whether all chiefs described in the fifth possibility held the titles of *ariki*. My informant just called them *upoko henua* meaning 'heads of land.' If only *ariki* had the privileges to establish districts, some of the 'districts' headed by *upoko henua* would have been subordinate territorial divisions incorporated into larger districts. As already discussed, however, it is also plausible that the lower chiefs could establish their own political units which were autonomous in some degree. Therefore, it would be necessary to include the territorial divisions from the fifth possibility in the list of districts.

3.3.3. *Marae* Serving as Symbols of Districts

As a result of the above examination, it is inferred that at least nineteen districts occurred in late prehistory. Table 3.3.2. indicates the relation between reconstructed districts and the rectangular *marae*. As shown in this table, fifteen of the nineteen districts have one *marae* within their territories.

One of exceptions to the general rule of one *marae* per district is the Atutahi where two *marae* occur. However, site TON-37, one of the *marae* on

Table 3.3.2 Relation between local districts and *marae* (1)

Lagoon Divisions	Reconstructed Districts	*Marae*
Omoka	Omoka	TON-25
	Motu-Unga	TON-01 (destroyed ?)
	Tokerau	TON-02
Ruahara	Ruahara	TON-04
Tausoata /Rukutia	Tausoata / Rukutia	TON-06
Hanoa	Hanoa	TON-07(2)
Tautua	Tautua	TON-08 (destroyed ?)
	Motunono	TON-09/II ? (in Kavea)
Naue	Temata	TON-10/I
	Naue (or Patonga)	TON-11
Rupu	Rupu	TON-12
Tepuka	Tepuka	TON-33
Atutahi	Atutahi	TON-15/I TON-37 (in Motu-o-Saki)
Motu-Rakinga		
Vaiari		TON-16/I TON-16/II TON-16/III
Hakasusa	Tapuroro	TON-17 oval court ? TON-38 graveyard ?
	Hakasusa	TON-29 ?
Mangarongaro (3)	Tevete	TON-28/I TON-19 TON-46 TON-20
	Mahera (or Mangarongaro?)	TON-27 TON-21 (in Hangarei) (4)
Motukohiti	Motukohiti	TON-22
Tautupae		TON-23 human-shaped monument

(1) The names of districts are listed in a clockwise direction from Omoka, the north-western islet in Tongareva atoll.

(2) According to Buck (1932a: 150), this *marae* belonged to Tautua. He noted that the district of Tautua had another main *marae* (TON-08) in its islet which was destroyed by the construction of a Christian church, and site TON-07 served as a second *marae* to the district.

(3) According to my informant (Mr. David Mahera), while the islet of Mangarongaro was divided into two districts, Tevete (the southern half) and Mahera (the northern half), the precise boundary between two districts is unclear. The spatial position of TON-27 *marae*, however, suggests that it belonged to the district of Mahera.

(4) TON-21 *marae* lies on the small islet of Hangarei, which is to the north of the district of Mahera, but Lamont stated that the people of Tevete exclusively used the islet.

this district, lies on the tiny islet of Motu-o-Saki which is close to the east coast of the large islet of Atutahi, and thus a specific meaning may be encoded in its location, as will be discussed later. The district of Tapuroro is also an exception. The boundary between Hakasusa and Tapuroro is unclear, and no rectangular *marae* have been discovered in or around Tapuroro. However, there are other monuments at the southern end of this district, a large oval courtyard (TON-17) surrounded by uprights, and a rectangular graveyard (TON-38).

The most marked exception is the islet of Mangarongaro, including the islet of Hangarei, on which there are six *marae*. One of my informants stated that the islet included only two districts, Tevete and Mangarongaro (or Mahera) [17]. I currently have no firm reason to explain why so many *marae* occur in this islet, and it is an issue for future study. Such a unique situation may, however, result from particular meanings or conditions assigned to each *marae*. For instance, TON-21 *marae* lies on the small islet of Hangarei which is separated from the main islet of Mangarongaro by a shallow channel, and thus it may show a similar meaning to that of TON-37 *marae* on Motu-o-Saki in the district of Atutahi.

More conspicuous in the district of Mangarongaro is the location of TON-46 *marae*. It is located at a cuspate spit projecting out from the lagoon shore, and it is possible to look out over the vast lagoon from the court (Fig. 3.3.5) [18]. In the unvarying landscape of the coastline, this position is easily seen from the lagoon. These conditions suggest that this *marae* served as a land mark to which high ranking persons were directed when visiting Mangarongaro.

TON-46 *marae* also lies very close to TON-19 *marae* which is located slightly inland. The latter *marae* is one of the few examples to have no inner component and to be provided with a single upright standing outside the court about 20 m distant from the front line of stones (see Fig. 3.2.2). It would have been used for seating *manuhiri* (visitors) [19]. This is in keeping with the

Fig. 3.3.5. TON-46 *marae* in the islet of Mangarongaro, Tongareva

While most of districts have one *marae* within their territories, there are six *marae* in the islet of Mangarongaro, which was divided into two districts. TON-46 *marae* is one of them, and the location is unique. The *marae* lies on a cuspate spit projecting out from the lagoon shore.

suggestions that these two *marae* were used for reception ceremonies for high ranking visitors coming from other districts. However, the data are so insufficient that we can not confidently determine the function of these two *marae* [20].

At any rate, what is apparent is that many districts have only one *marae* within their territories. This indicates that these *marae* served as symbols of the districts. In each district, where subsistence economy was practiced at a household level, ceremonies performed at the *marae* would be one of few opportunities for all the members of the district to meet together.

Lamont's observation of a ceremony at a marae gives some insight into this issue (Lamont 1867: 121-2). According to him, while the women and children were not allowed to enter the precinct of the *marae*, all the male members proceeded into the sacred place, and some of them played important roles in the ceremony. For instance, (1) four young men frightened away the evil spirits from the *marae* with their spears, (2) two old men took a seat on either side the *marae* and began a low and hurried chant, (3) two young men (probably two of the above four young men) stood at the base of uprights and husked coconuts to dedicate to gods, and (4) the highest ranking man (*ariki*) ascended to the platform with a god statue made of coconut leaves and was then possessed by the spirit.

The people would confirm their participation in, or their affiliation to, the district through their attendance at such ceremonies. In particular, some persons could display their superior status to other members by playing particular roles in ceremonies. It is therefore plausible that Tongarevan *marae* were symbols of districts, inspiring in the people a feeling of membership, in the same way as iconographies of flags or insignia. The construction of a *marae* would symbolically represent the establishment of new district.

3.3.4. A Variety of Expressions of Territoriality

What is a territorial marker? I have set out the relationship of *marae* with Tongarevan segmentary districts. In the next section, I will look at various features of territorial markers in order to examine the relationship of *marae* with district territoriality. Renfrew (1984: 176) states that territorial behavior implies the habitual use of specific, localized area which constitutes the sphere of influence of a segmentary group, and that concomitant to this behavior is often a spatial identity reflected in symbolic marking of the territory. In short, a territorial marker can be viewed as a symbolic object expressing the spatial range which is controlled by a social group.

Renfrew (1984: 178) also states that territorial markers are generally constructed in the heart of territories. Several Tongarevan *marae* are located approximately in the center of districts (Fig. 3.3.6). TON-28/I *marae* in Mangarongaro is a good example. It lies approximately in the middle of the southern half of Mangarongaro. As already discussed in Section 3.2, this *marae* lies also close to TON-28/III settlement which could be the household unit of a chief who controlled one of the districts of Mangarongaro (probably Tevete). TON-28/I *marae* not only illustrates the spatial centrality of ceremonial structures within districts, but also suggests their spatial association with political centers.

In addition, the TON-28 site complex demonstrates a Tongarevan settlement pattern consisting of rectangular *marae* (TON-28/I), a dwelling space (TON-28/III) and a small circular courtyard enclosed with several uprights (TON-28/II) (see Fig. 3.2.4). Of interest is the circular courtyard which was situated between the *marae* and the house foundations, and thus appears to exteriorize the concept of a boundary between the dwelling and the ceremonial spaces which are close to each other.

Similar courtyards occur in vicinities of several rectangular *marae*, TON-09/II in Motunono, TON-10/I in Temata, and TON-15/I in Atutahi (see

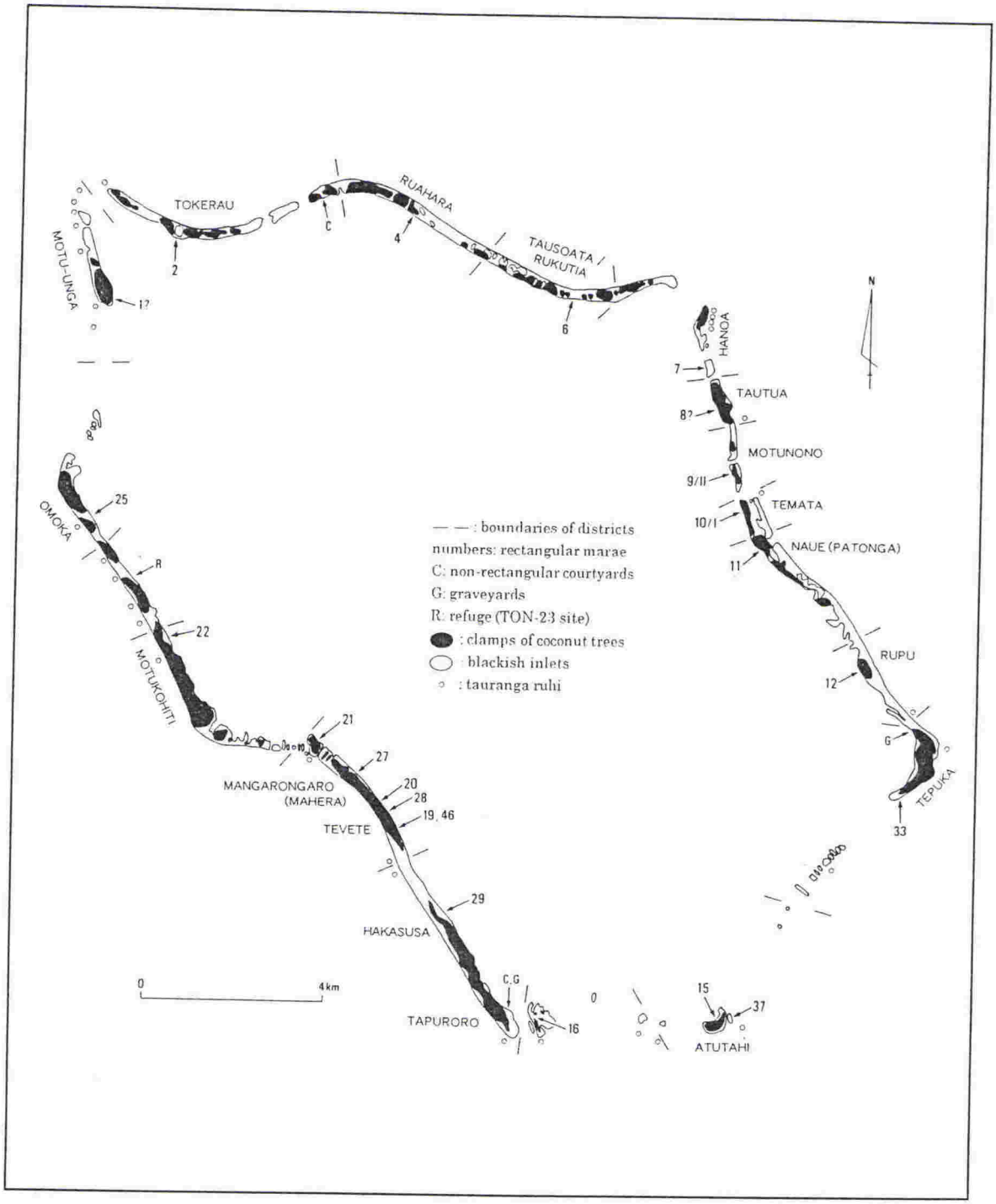

Fig. 3.3.6. Territories of districts (*huaanga henua*) and distribution of *marae*

Renfrew (1984: 178) points out that territorial markers are generally in the heart of territories. Several Tongarevan *marae* appear to lie at the center of districts. However, there are not enough sites to conclude that the central *marae* location is prevalent in Tongareva. Tongarevan *marae*, instead, demonstrate a variety of spatial expressions of territoriality. Supporting this, several *marae* are associated with the boundaries of districts, and others are associated with particular properties or resources such as satellite islets, fishponds, and fishing points for Black Trevally (*tauranga ruhi*).

Section 3.2.2). While there is currently no archaeological evidence for adjacent house foundations, the existence of both *marae* and small courtyards, which probably served as boundaries between the dwelling and the ceremonial spaces, suggests that a similar settlement pattern to that of the TON-28 site complex would have been found in the above three districts. If this is so, there is the possibility that TON-09/II, TON-10/I and TON-15/I *marae* also exhibit the spatial centrality associated with political centers within districts.

Renfrew, however, provides no answer to the question of why spatial centrality must be a general expression of territoriality in human societies. It makes sense that there might be various ways to express territoriality. Supporting this, Tongarevan *marae* appear to exhibit district territoriality in various ways.

One is the expression of boundaries. The most definite example of this is TON-22 *marae* in the district of Motukohiti. This district was exposed to oppression from its militant neighbour Omoka at the time of Lamont's visit. The two districts were separated by a division (Tautupae) of uninhabited land on which a unique human-shaped structure (TON-23) existed for refuge. TON-22 *marae* on Motukohiti also lies at the northern end of its territory. The political tension between the two districts makes it easy to envision that the people in Motukohiti constructed their *marae* at the northern boundary which was more exposed to the menace of a neighbouring district, and thus had more power and sacredness. TON-29 *marae* in Hakasusa and TON-33 *marae* in Tepuka would also belong to this category. These sites lie at the edge of coconut clump close to the boundary or the edge of the islet (Fig. 3.3.6).

Secondly, there is the expression of exclusive tenure of satellite islets which are distant from the main territory of a district. The list of lagoon divisions includes those associated with several southeasternmost small islets (see Table 3.3.2). Intriguingly, there are three *marae* on Vaiari, one of these islets (Buck 1932a: 169; Bellwood 1978: 169). Lamont reported that Vaiari belonged to Tepuka, which is a district at the southeastern corner of

the atoll, although the islet had been abandoned because of the dangerous proximity to Hakasusa (Lamont 1867: 228). The occupation of this satellite islet by Tepuka is supported by the morphological similarity of the inner component of the three *marae*. They all have a similar type of stone arrangement within confines of their court. This is a characteristic of *marae* on the eastern islets including Tepuka (this topic will be discussed later in Section. 3.4).

Another instance of this expression of tenure is found on the islet of Hangarei, on which is found TON-21 *marae*. This islet is located north of a large islet called Mangarongaro, and separated from the latter by a shallow reef-channel. Mangarongaro is said to have been divided into two districts, Mahera (or Mangarongaro) in the northern half of the islet and Tevete in the southern half. However, Hangarei was used exclusively as a source of coconuts by the people of Tevete (Lamont 1867: 161). Thus, there is the possibility that TON-21 *marae* was a tenure marker which stated that the district of Tevete held Hangarei as a satellite islet. In the same way, TON-37 *marae* which lies on the small islet called Motu-o-Saki could have served as a tenure marker of the district of Atutahi, although these two islets are comparatively closer to each other.

The third expression is similar to the second one, but more closely related to particular resources. While coconut trees were essential in the subsistence economy of traditional Tongarevan society, several kinds of fish were also valuable. One of them is Milkfish (*Chanos chanos*) called *ava*, a very fertile species. It can breed in a wide range of environments from freshwater to brackish water containing as much salt as 40 ‰. The species can also survive water temperatures as high as 40 °C [21]. This hardy fish is still cultivated in brackish inlets formed by geomorphological processes (Fig. 3.3.7) [22]. The aquaculture of Milkfish, in comparison with game fishing, supplies a more consistent quantity of fish. Therefore, it is not strange that these inlets were recognized as valuable properties in several districts.

Fig. 3.3.7. A brackish inlet used as the fishpond of Milkfish in Tongareva

The aquaculture of Milkfish is still continued in several brackish inlets. Since it could constantly supply a regular quantity of fish, the inlets would have been recognized as valuable properties of districts. Of interest is that several *marae* are spatially associated with such inlets. This photo shows an inlet in the district of Ruahara, one of northern districts, to which TON-04 *marae* is adjacent.

What is apparent is that several *marae* are spatially associated with such inlets. The clearest example is site TON-02 on Tokerau, one of the northern districts. This *marae* appears to be located in the middle of the district on the map. In fact, it stands at the edge of an inlet lying between coconut clumps (Fig. 3.3.8). At the narrow end of the inlet adjoining the lagoon shore, there is a line of curbstones which is likely a part of a structure used to drive and catch a school of fish. The eastern side of TON-02 *marae* is adjacent to this stonework. This spatial proximity suggests the intentional linkage of the ceremonial structure with the fishpond or the aquaculture of Milkfish. Other instances of *marae* close to brackish inlets are site TON-04 on Ruahara, site TON-10/I on Temata and site TON-11 on Naue (or Patonga).

It is likely that several districts cultivated Milkfish in artificial

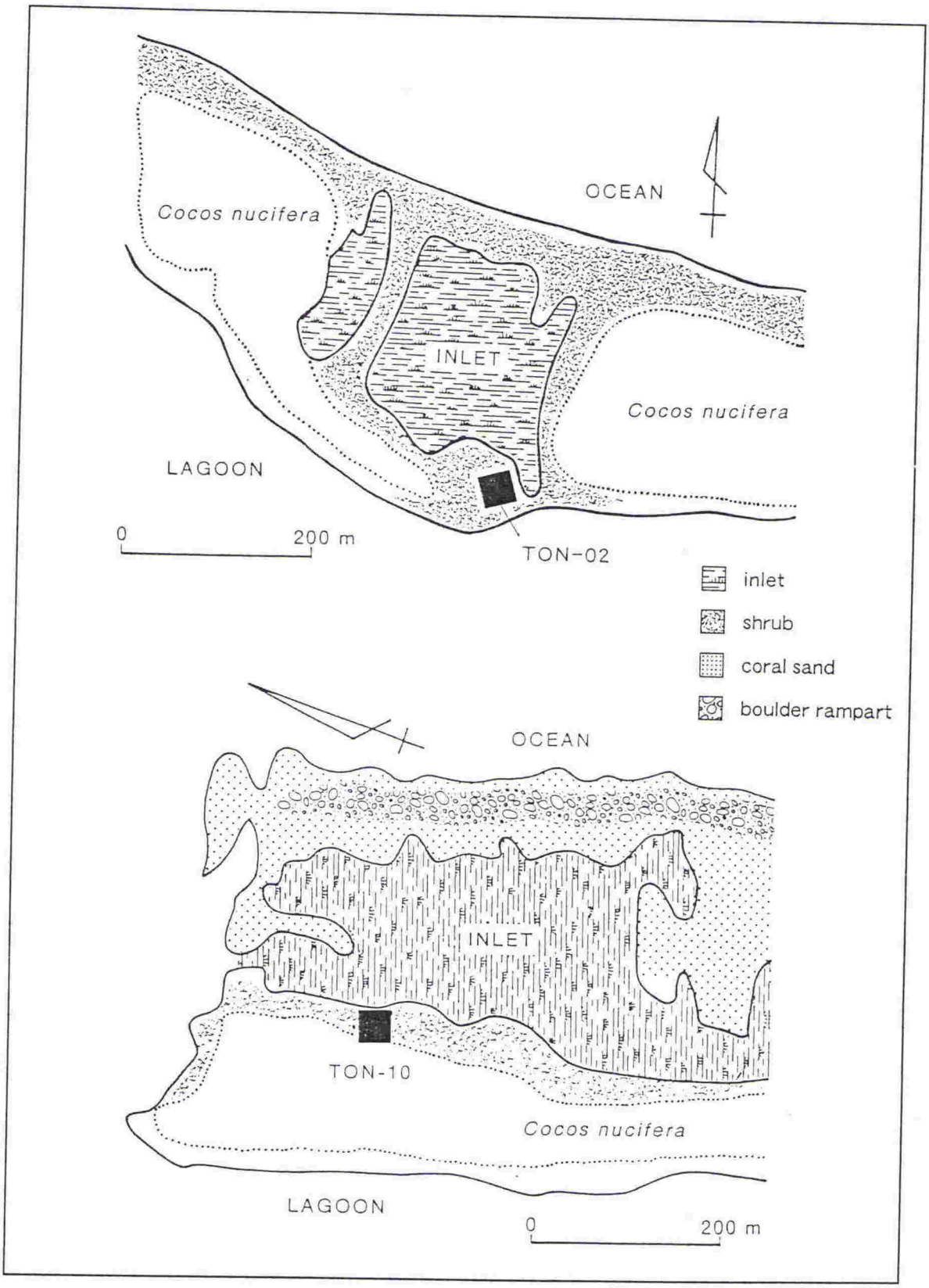

Fig. 3.3.8. Tongarevan *Marae* spatially associated with brackish inlets

Several *marae* are spatially associated with brackish inlets which the people used as fishponds for Milkfish. The upper diagram illustrates the location of TON-02 *marae* on Tokerau (one of the northern districts), and the lower shows the location of TON-10/I *marae* on Temata (one of the eastern districts).

fishponds as well. The most probable example of such fishponds is site TON-35 on Tepuka. This architectural feature extends into the shallow water between the lagoon beach of the main islet and a natural spit parallel to the beach. It consists of six sections partitioned by stone walls (Yamaguchi 1995: 69-72). A similar structure is also observable within the TON-27 site complex which is located in the northern part of Mangarongaro (probably the district of Mahera), although Bellwood (1978: 183) reported it as a site used for salt evaporation. Districts having no natural inlet could construct fishponds for the farming of Milkfish by modifying the topography of spits and shallow depressions formed behind the lagoon beach. Of interest is the possibility that the exclusive use of such features by particular districts was also expressed by *marae*. While no *marae* have yet been discovered around TON-35 fishpond, this possibility is supported by a disturbed *marae* which is adjacent to the structure in the TON-27 site complex (Bellwood 1978: Fig. 91).

Another valuable fish in the traditional subsistence economy is Black Trevally (*Caranx lugubris*) which is called *ruhi*. It appears to have been a particular delicacy or favourite with the people (Lamont 1867: 179). The fish tend to congregate at gaps or hollows on the ocean side of coral reefs during its spawing period. Such places are now termed *tauranga ruhi*, each of which has a specific name. While the people catch many kinds of game fish, the term of *tauranga* — literally meaning "places of coming to rest" (Buse 1995) — is applied only to *ruhi*. This demonstrates that the people distinguish Black Trevally from other species.

The Tongarevan fishermen catch this fish in a unique way. Mr. Arake Tonitara — one of the skilled fishermen who took me fishing — explained that at first a fisherman dives 3 - 5 m deep to reef slope with some pieces of fresh tuna or bonito, spreads the pieces of fish around a *tauranga* to lure the *ruhi* towards the edge of the coral gap. The diver then brings a hook with a piece of bait close to the *ruhi*, when one takes the bait the diver makes a sign by drawing up the line attached to the hook and another fisherman waiting on the canoe quickly pulls up the fish. The similar fishing method called

hakaruku was reported by Chalmers who visited Tongareva in 1875. He also described that it was astonishing the number of fish the people got this way in a very short time (Campbell 1985: 46).

Although Black Trevally is a game fish, the Tongarevan people view it as more valuable than other species, as they can expect a sure catch if they know the positions of the *tauranga ruhi* and the unique fishing method. Intriguingly, several *marae* seem to be spatially associated with the locations of *tauranga ruhi*. TON-25 *marae* in Omoka is a good example (Fig. 3.3.6). In addition, locations of *marae* (TON-16/I, 16/II, 16/III, 21 and 37) on small islets fit in with this possibility (Fig. 3.3.9). These small islets would have been incorporated into the satellite territories of particular districts, as they contained valuable resources other than coconut trees.

Both fishponds and *tauranga ruhi* are unevenly distributed around the atoll and even within districts. Their distribution pattern quite differs from that of suitable lands for the planting of coconut trees. In addition, it is not easy to divide these resources into small sections and distribute them to individuals. This suggests that such resources were controlled at a higher social level than were the coconut trees, probably at the level of the district. There is therefore the likelihood that several *marae* were used as tenure markers which symbolically legitimated the exclusive use of fishponds or *tauranga ruhi* by a particular district.

Tongarevan *marae* were symbols of districts. The people could strengthen their affiliation with a particular district by joining ceremonies performed at their *marae*. *Marae* also served as visible markers which informed outsiders that something important or valuable belonged to a particular district. However, valuable things would be particular to each district. The boundaries of territories were so important to several districts that they symbolically protected them with *marae*. Some districts constructed *marae* to notify others of their tenure of satellite territories, and other districts, by the construction of *marae*, exhibited that valuable resources such as fishponds or *tauranga*

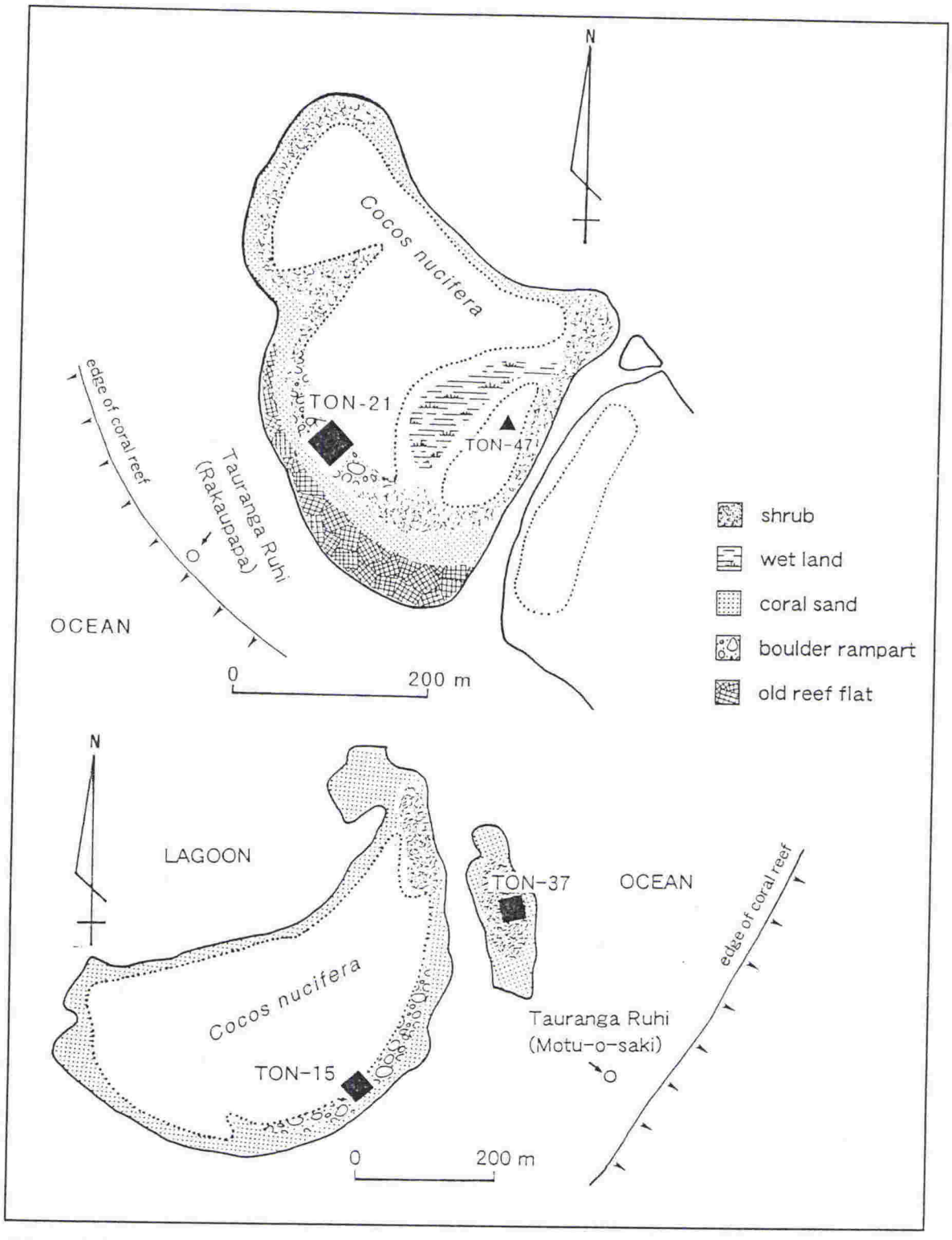

Fig. 3.3.9. Tongarevan *Marae* spatially associated with *tauranga ruhi*

Several *marae* are spatially associated with fishing points of Black Trevally. These points are called *tauranga ruhi*. Black Trevally is one of game fishes, but the species would have been viewed as more valuable than others, because the people could expect the sure catch of fish in some degree by means both of the knowledge of *tauranga ruhi* and the unique fishing method. The upper diagram exhibits the spatial association of a *tauranga ruhi* with TON-21 *marae* in the islet of Hangarei. The lower shows the spatial association of other *tauranga ruhi* with TON-37 *marae* on the small islet of Motu-o-Saki.

ruhi were their exclusive property. Broadly, these *marae* can be placed in the category of territorial markers, but the specific territoriality expressed by the *marae* were related to meanings peculiar to each district. These very local meanings explain why *marae* occur at given places within the confines of the sterile landscape.

3.4. Morphology and Orientation of *Marae* — Meanings at Levels of Inter-Districts and Entire Atoll —

In the two preceding sections (Section 3.2 and 3.3), I examined locations of *marae*. Here, I shift my focus to their morphology and spatial orientation [23]. As discussed below, several morphological features and an orientation are commonly observed in many *marae*. We can thus infer that these characteristics were related to prevailing meanings which were broadly shared by social ranges beyond districts.

3.4.1. Morphological Types of *Marae* and Their Distributions

Among Tongarevan architectural features ceremonial structures termed *marae* are largest in number (twenty-three sites). These *marae* consist of a rectangular court, coral uprights and an inner component. The general design is thus analogous to that of *marae* recorded from the Society and the Tuamotu Islands.

Tongarevan *marae*, however, also exhibit several variations of elements. For instance, courts of some *marae* are enclosed by curbstones and uprights but others are just edged by uprights standing along the peripheries. Uprights also exhibit various shapes. Popular uprights are just rectangular in shape, but some are flanged, knobbed, notched, shouldered, medial-curved or perforated (Yamaguchi 1995: Fig. 5). The permutation of these variations

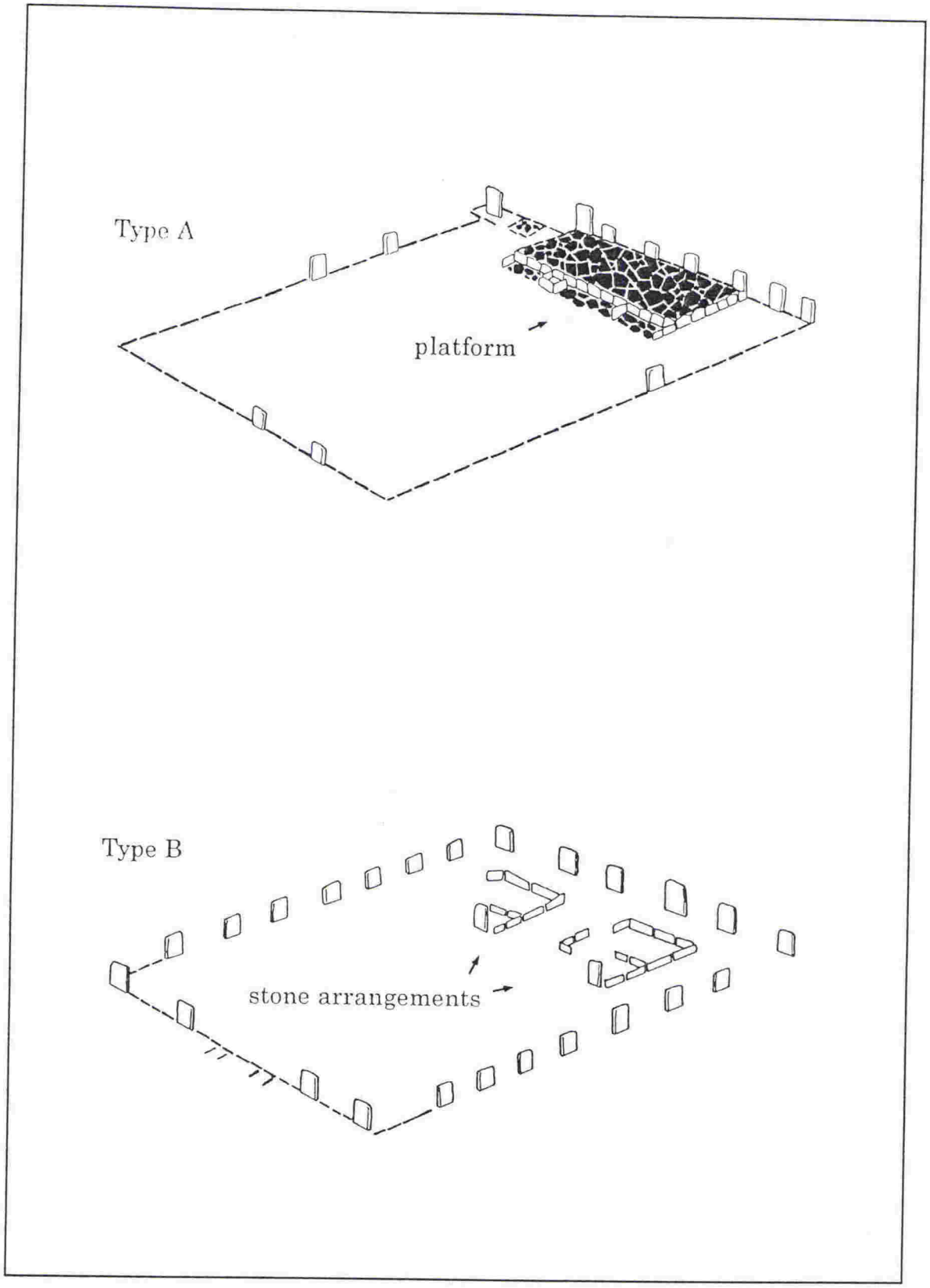

Fig. 3.4.1. Morphological classification of Tongarevan *marae*

Tongarevan *marae* are classified into two types on the basis of the morphological variation of the inner components at the rear of the courts. Type A *marae* has a platform inside the court, and Type B *marae* has two stone arrangements which are like a reversed letter "F" or "L" in shape.

makes each *marae* somewhat unique, but the most remarkable variations are seen in the morphology of the inner components at the rear of *marae* courts. On the basis of these variations, we can classify *marae* into two types (Fig. 3.4.1).

Type A *marae* are characterized by their rectangular platforms. Most platforms are raised approximately 50 cm in height. These structures are faced by rows of coral slabs set on edge, and their interior is filled with coral gravel and boulders. In addition, well-preserved structures suggest that the surface of platforms was usually paved with flat coral slabs. Type B *marae* have two arrangements formed with coral slabs, and these structures resemble a reversed letter "F" or "L" in shape.

One of the Europeans who landed on Tongareva Atoll in early 19 century AD was E.H. Lamont, an American trader. He stayed on the atoll for nearly a year and observed several ceremonies in different districts. One of these ceremonies began when the people marched to their *marae* from a chief's settlement, and progressed through the purification of the court and the offering of coconuts:

> O Packa, as this chief and high priest was called, on receiving one of the cocoa-nut gods, ascended the altar, and, seating himself in front of a large stone, while he held his god in both hands, began to glance wildly round in every direction, his eyes wandering over the crowd of bowed figures before him. A trembling motion, commencing in his hands, extended through his whole body till every limb shook in the most violent manner, the muscles working and the veins swelling almost to bursting — a sign, as these ignorant creatures believed, that he was possessed by a spirit. [Lamont 1867: 122 (emphasis mine)]

This paragraph, describing a ceremony performed at a *marae* on the islet of Mangarongaro, illustrates that the *marae* was provided with a platform-like structure, and it can be thus classified as belonging to Type A. It is evident that this platform was used in the climax of the ceremony as the point at which gods or holy spirits descended.

Lamont does not provide us with any descriptions of the inner component of Type B *marae*. Their stone arrangements, however, occupy an equivalent position to that of the platform within Type A *marae*. This conformity of configuration between two types suggests that stone arrangements of Type B *marae* also served as focal points in ceremonies. Information on TON-07 *marae* provided by Buck supports this possibility. While this *marae* on a small islet of Vaiseru was heavily disturbed, it is classified as belonging to Type B *marae*. Buck states — on the basis of explanations given by an old man of Tautua Village — that the stone arrangements in the *marae* were termed *raukava* which means the position occupied by *au mana*, or authorized people who were probably priests (Buck 1932a: 162).

Platforms and stone arrangements are mutually exclusive in Tongarevan rectangular *marae*. No *marae* have both inner components. This raised the question of why such marked variations arose in this atoll. One likely reason may be the difference in construction periods. However, Radiocarbon dates from Tongarevan *marae* are still so limited that we can neither prove or disprove the possibility that the morphological differences between the two types reflects temporal variability. The earliest *marae* in the atoll, TON-21 *marae* (dated to around 400 yr. BP), is classified as Type A, and thus it would seem likely that Type A *marae* appeared prior to Type B [24]. Excavations of other sites, however, have revealed that *marae* of both types were also built in late prehistory. For instance, TON-28/I *marae* (Type A) in Mangarongaro was constructed within the last 200 years, as was TON-33 *marae* (Type B) in Tepuka (see Section 3.1.2 and Appendix 2).

The coexistence of both types of *marae* in late prehistory leads us to see specific meanings or intentions within the two types of inner component. The best evidence for this meaning is the spatial distribution of each type of *marae*. The land of Tongarevan Atoll mainly consists of a chain of islets surrounding a vast lagoon, and all *marae* exist on these islets. In plotting the position of *marae* of each type on the map, it becomes clear that these ceremonial structures are distributed separately by type (Fig. 3.4.2). While

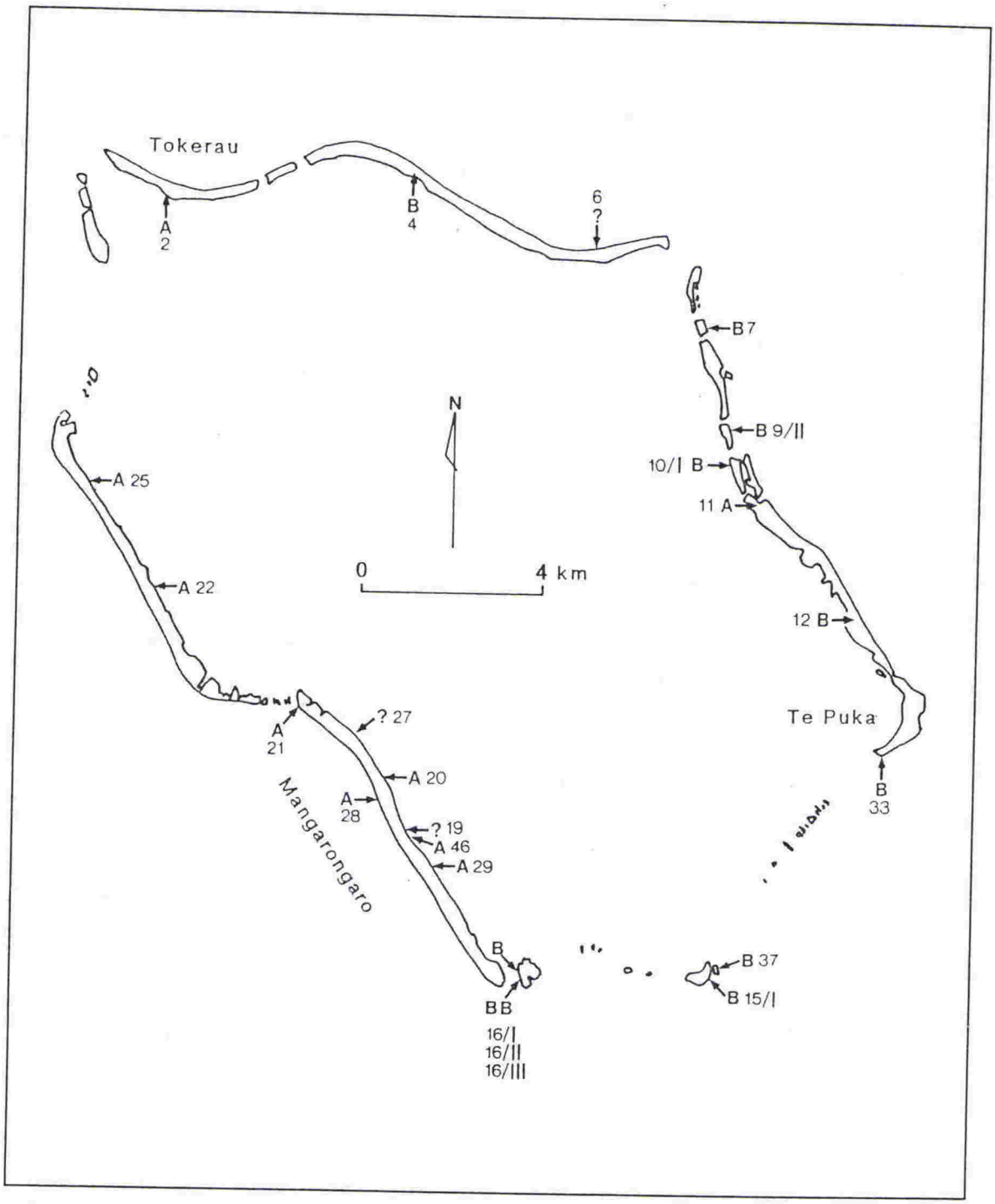

Fig. 3.4.2. Spatial distribution of each type of Tongarevan *marae*

Tongarevan *marae* have a tendency to be distributed by type. Type A *marae* (with a platform) are mainly distributed on the western islets, and Type B *marae* (with double stone arrangements) lie mainly on the eastern islets.

there are a few exceptions, Type A *marae*, with a platform, tend to be on the western islets, and Type B *marae*, with two stone arrangements, tend to be on the eastern islets.

As already discussed in Section 3.3, at least nineteen districts were established in late prehistory, and each of these many districts had a *marae* as its own symbol. It is, however, also a fact that some exceptional districts had more than two *marae*. On the islet of Mangarongaro — probably divided into two districts — six *marae* occur, and there are two *marae* in the district of Atutahi. While there is the only one *marae* in the main territory of Tepuka, this district is meant to have had a satellite islet called Vaiari, where three *marae* existed.

What is noteworthy is that all the *marae* within each of these districts are provided with inner components of the same type. This indicates that each district intentionally selected either a platform or stone arrangements as the inner component of its *marae*. Seen in this light, it would be plausible to suggest that the distribution of each type of *marae* reflects some sort of social relationship between the eastern and western districts.

3.4.2. Political or Genealogical Relationships among Districts

One of the possible social relationships expressed by the *marae* would be political alliances among districts in late prehistory. Tongarevan districts, as has already been mentioned in the preceding sections, were markedly autonomous and in a constant state of feud with one another, but some frequently established political relationships for mutual protection (Lamont 1867: 126). Campbell (1985: 73), quoting information given by Lamont, concludes that Tongarevan districts were united into three political units which he terms *hititangata* (Fig. 3.4.3).

One of the political units consisting of the eastern and southern districts

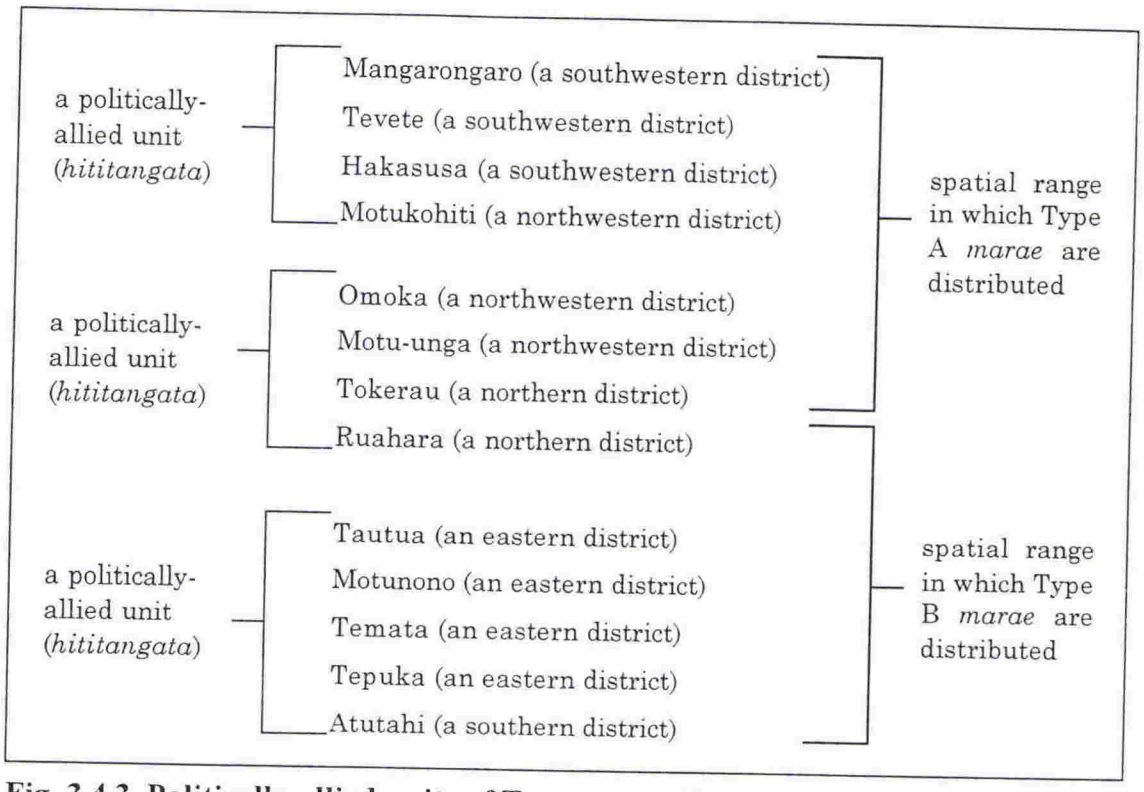
a politically-allied unit (*hititangata*)
Mangarongaro (a southwestern district)
Tevete (a southwestern district)
Hakasusa (a southwestern district)
Motukohiti (a northwestern district)
a politically-allied unit (*hititangata*)
Omoka (a northwestern district)
Motu-unga (a northwestern district)
Tokerau (a northern district)
Ruahara (a northern district)
spatial range in which Type A *marae* are distributed
a politically-allied unit (*hititangata*)
Tautua (an eastern district)
Motunono (an eastern district)
Temata (an eastern district)
Tepuka (an eastern district)
Atutahi (a southern district)
spatial range in which Type B *marae* are distributed

Fig. 3.4.3. Politically allied units of Tongarevan districts

Tongarevan districts sometimes formed political alliances for mutual protection. Campbell (1985: 73) reconstructed such allied units (*hititangata*) from information given by Lamont. However, there are several discrepancies between the spatial distribution of each type of *marae* and these political units.

appears to fit well with the spatial distribution of Type B *marae*, but there are also several discrepancies. A *marae* of Type B occurs in Ruahara, one of northern district, but this district was politically united with the north-western districts where Type A *marae* are distributed. The more marked discrepancy is that the western districts where Type A *marae* are exclusively distributed would have been politically divided into two units, the northwestern and the southwestern units. In particular, a description that the districts of Omoka and Motukohiti "were at war with each other" must be noted (Lamont 1867: 169; see also Section 3.3.2).

It would be somewhat incorrect to assert therefore that the social relationships to which the morphological variations of the inner components were related were unstable and temporary political alliances. Rather, these

variations would likely have reflected a more general principle, which political alliances were also basically dependent on. The most plausible principle would be a genealogical one.

In relating the history of Tongareva, the people name three founding ancestors. One was Taruia, who came to the atoll from Aitutaki or Savaiki, another was Mahuta, who came from Rakahanga via Tahiti. The last was Takatu, who is said to "have belonged to a previous migration" (Buck 1932a: 17). In short, Takatu is an indigenous chief, while the first two can be viewed as stranger chiefs [25]. The structure in this early genealogy consists of three main lines as described above, but the Takatu line, at least the main line descended from Takatu, appears to have been gradually incorporated, or assimilated, into one of the stranger lines through marriage (Fig. 3.4.4).

Tongarevan traditions record that Taruia, one of the stranger ancestors, landed on Tokerau; and that Mahuta, the other stranger ancestor, established his settlement on Tepuka. It is interesting to note that on Tokerau, at the northwestern end of the atoll, there is a *marae* with a platform. Tepuka is, on the contrary, at the southeastern corner of the atoll and has a *marae* with two stone arrangements. This suggests that the people of Tokerau, who descended from Taruia, selected the Type A design for the construction of their *marae*, and the people of Tepuka, who descended from Mahuta, selected that of Type B.

The western districts were divided into two politically-allied units, the northwestern and southwestern. An Aitutakian version of Taruia tradition, however, suggests that the southwestern islets, in particular Mangarongaro, were also settled by social groups descending from the Taruia line (see Section 3.3.1). It is therefore likely that the people in the southwestern districts were descended form social groups which had branched from the main Taruia line in the earlier phase and that the political separation of the two units in late prehistory resulted from the considerable genealogical distance between the northwestern and the southwestern districts.

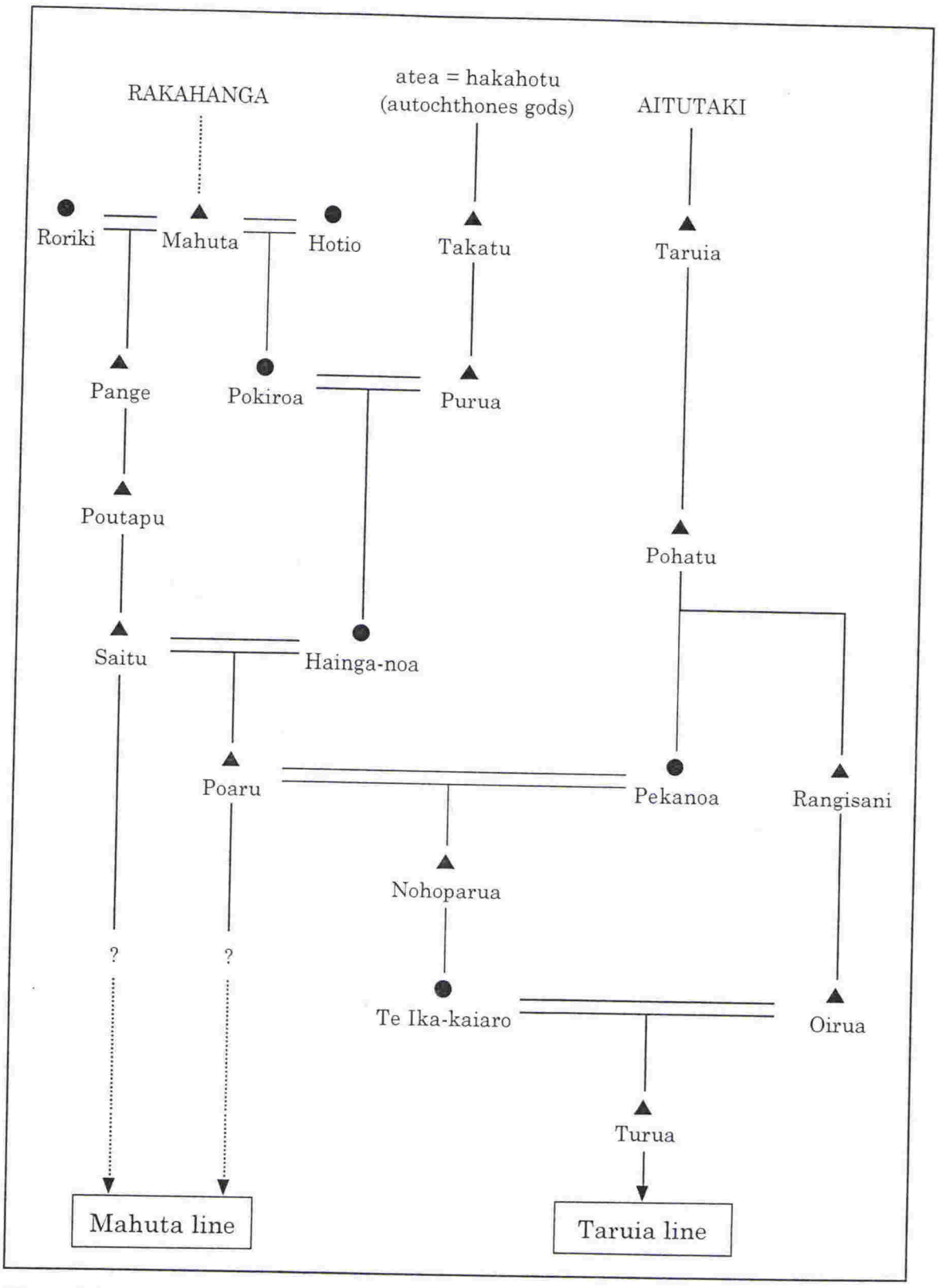

Fig. 3.4.4. Structure in the Primordial Genealogy

The Tongarevan genealogy consists of three primordial lines descending from three founding ancestors, but the Takatu line, probably indigenous, would have been gradually incorporated into the Taruia or the Mahuta line through marriage ties. The diagram is based on information given by Buck (1932a: Table 2 & Table 6). In the diagram the symbol ▲ indicates males, and the symbol ● means females.

It is difficult to interpret social relationships between districts only on the basis of archaeological evidence. However, if it is legitimate to use the above ethnohistoric accounts as the context, the morphological variations of the inner components of *marae* could be understood by the extention of the contrast between Tokerau (Taruia) and Tepuka (Mahuta). Each district would thus select either Type A or Type B *marae* — similar to either the *marae* of Tokerau or of Tepuka — in order to exhibit the genealogical relationship to either the founding line of Taruia or of Mahuta.

This phenomenon can be seen in the many ceremonial structures called *marae* in the Tuamotu Islands. Emory (1947: 10) generalized these sites as being material symbols which for social groups had formed a visible connection with the past. Such groups could claim their right to particular lands only by exhibiting their connection with their past or genealogies. In Section 3.3, I discussed the possibility that Tongarevan *marae* had served as territorial markers or tenure markers. Supposing that Tongarevan *marae* were material symbols in the same way as the Tuamotuan *marae*, the above interpretation of meaning encoded behind the morphological variations of Tongarevan *marae* fits very well.

3.4.3. Spatial Orientations of Tongarevan *Marae*

Tongarevan *marae* also exhibit a common orientation, which extends across both variations of inner components. Spatial orientation is defined here as the direction of the perpendicular axis to the rear of the *marae*, which is identifiable by the proximity of the inner component and the existence of taller uprights. Twenty-one sites providing reliable information were examined for orientation.

The result is shown in Fig. 3.4.5. There is no tendency for Tongarevan *marae* to be orientated to such things as the sun, stars or the prevailing wind [26]. However, it is evident that sixteen out of the twenty-one *marae* are

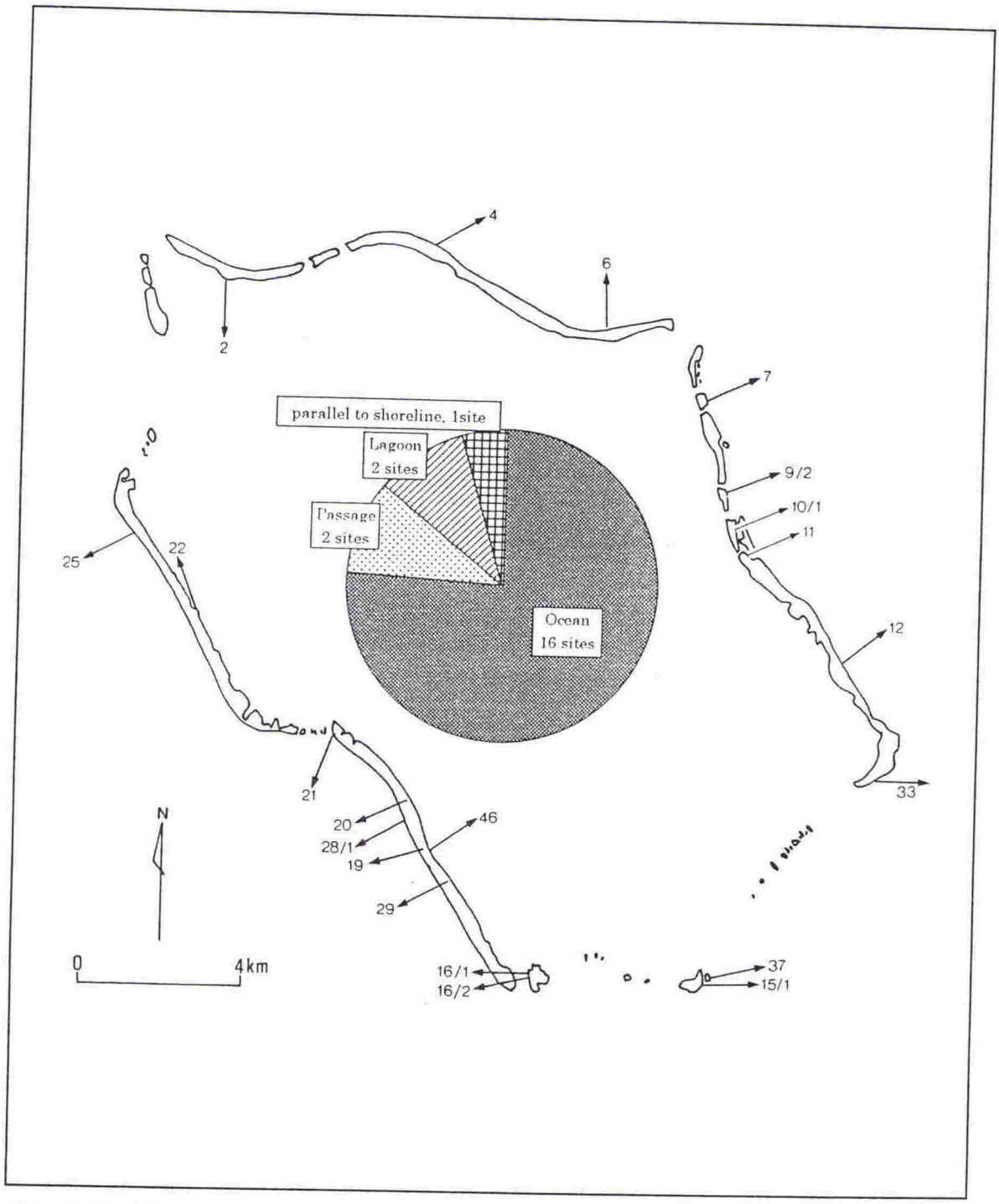

Fig. 3.4.5. *Marae*-orientations in Tongareva

Twenty-one *marae* which provided reliable data were examined for orientation. More than 75 % of the *marae* exhibit the same orientation — pointing toward the ocean.

orientated toward the ocean. It means that their axis meet the adjacent shoreline at right angles.

There are certainly other *marae* exhibiting different orientations: two sites are directed toward the lagoon, two sites are pointed toward the reef passage; and one site's axis is parallel to the shoreline. But in the analysis more than 75 % of *marae* share the same orientation. They are directed toward the ocean. This tendency is discernible on both the eastern and the western islets. In addition, several *marae* located at the lagoonside, from which the ocean is not visible, are orientated toward the ocean. This fact demonstrates that a prevailing meaning, related to the ocean, was encoded in many Tongarevan *marae*.

There are, however, few ethnographic accounts of the Tongarevan cosmological beliefs. The names of gods, the religious system consisting of the gods and spirits, and the destination of souls are little known. The only things currently known are that the spirits of the dead went to a distant region, and that the people saw their dead friends in the stars overhead (Lamont 1867: 181; see also Williamson 1933: 107, 126). Therefore, it is difficult to discuss specific meanings encoded in the prevailing *marae* orientation in more than a cursory fashion.

By referring to relevant information from other islands in Polynesia, however, it is possible to speculate on the meanings to some degree. For instance, ethnographic accounts state that the ocean was recognized as the "highest *marae*" in the ancient Tahitian society, and that "On the seaside the wanderer or exile who owned no land worshipped his god" (Henry 1928: 143).

The souls were believed to reach the world of the dead by passing on, over, or under the ocean in many islands or island groups such as the Tuamotu Islands (Williamson 1933: 82), the Marquesas Islands (Williamson 1933: 62-3) and Rarotonga in the southern Cook Islands (Gill 1876: 193). In addition, the general relationship between gods and the ocean has been reported from many islands in various forms: a god who is the ocean (Tahiti),

the home of the gods under the sea (Cook Islands and Hawaii), a god living in the coral reef (Tahiti), the divinity departing in a boat over the sea (Hawaii), sea gods (throughout Polynesia), and so forth (Kertley 1971: 3-33). These accounts illustrate that the ocean was linked with sacredness as an important motif throughout Polynesia. It is therefore likely that such a symbolic linkage was also exhibited on Tongareva by orienting *marae* toward the ocean.

3.5. Prevailing Features of *Marae* in the Segmentary Society

In Section 3.3, I discussed the possibility that Tongarevan *marae* expressed the territoriality of districts, or their exclusive tenure of various properties; but did not include a discussion of why *marae* could have served as territorial markers. Probably the simplest answer to this question is that *marae* were ceremonial and sacred places. While this is important, it is somewhat facile to think that it is the only reason. It would be interesting to consider how *marae* could have been ideologically sacred and inviolable in prehistoric Tongarevan society.

As already discussed, the late-prehistoric features of Tongarevan society can be summarized in two points: (1) it was a segmentary society which was devoid of a stable entity having integrated all the districts into a single political system, while districts were all much of a muchness with respect to population, resources, and armaments; and (2) the districts were in a constant state of feud with each other. It is quite plausible that in such conditions each district depended partially for its survival on reverence for *marae* as sacred to prevent others from disturbing the properties. In order to impose on a *marae* of a particular district a concept of sacredness which would be respected by the people in other districts, however, it would be indispensable that a common ground or ideology on 'how sacred *marae* should be' was held by all (or at least most) districts even in a segmentary society.

What common elements are present in Tongarevan *marae*? We can first identify a rectangular courtyard and coral uprights as elements shared by all *marae*. These elements are also seen in graveyards (see Fig. 3.1.3). In addition, uprights are important elements in forming a circular courtyard (TON-03) which was related to turtle ceremonies. These elements' wide use in ceremonial structures illustrates the sacredness with which they were held by the entire Tongarevan society. Seen in this light, the prevailing orientation of *marae* toward the ocean could be another element which imposed the sacredness on *marae*. This could be also the case with the spatial separation of *marae* from dwelling spaces, labeled as a "secluded location" in Section 3.2.

Tongarevan *marae* are classified into two types on the basis of variation of their inner component: Type A has a platform and Type B has double stone arrangements. In this atoll neither type is predominant in number: there are nine *marae* of Type A and eleven *marae* of Type B. It is therefore impossible to say that either variation was related to a concept of sacredness which were shared by the entire atoll. Each variation is, however, presumed to have been a material symbol which formed a visible connection of districts with either main genealogical line, Taruia or Mahuta. It is inferred that the variation served as an element which imposed on each *marae* legitimacy as territorial (or tenure) marker, and which operated within a larger social group consisting of several districts. In this sense, it would be proper to include both variations of the inner component in the inventory of elements necessary to construct 'sacred' *marae*.

Autonomous districts within the segmentary Tongarevan society are assumed to have guided their own affairs. For example, each selected the place for *marae* construction based on their own needs. This is supported by my contention that the territoriality expressed by *marae* was related to various local contexts peculiar to each district. However, in exteriorizing the sacredness — an intrinsically invisible concept — in the architectural features of *marae*, each district must also have adopted common elements

necessary to construct a legitimate *marae* as understood by the entire Tongarevan society.

3.6. Summary of Chapter 3 — the Variety of Meanings Encoded in Tongarevan *Marae* —

Among the architectural features of Tongareva, an atoll in the Northern Cook Islands, the rectangular courtyards called *marae* are the most impressive both in number and in size. In this chapter, I have attempted to interpret possible meanings encoded in several characteristics of these *marae* (Table 3.6.1).

First of all, the spatial separation of *marae* from dwelling spaces was examined at the level of the household units, and then three possible meanings were discussed: economic, social and ideological. These meanings were probably not independent of each other, but interrelated. While coconut trees were an essential resource in this atoll, the plantations required extensive fields. This brought about a dispersed settlement pattern and a system of land tenure which operated at the level of the household units. Such material and social factors would divide cognitive distinction of land into two spheres, economically-valued and socially-divided land, and worthless and communal land.

These binary oppositions were probably related to the secluded location of *marae* but would not necessarily affect the choice of places for *marae* directly. Rather, the distinction between a profane area for daily activities and a sacred space for ceremonial activities would have been gradually formed, as the relative value of coconut trees and the division of land — along with the population growth — increased in late prehistory. In summary, the construct of *marae* as ceremonial places would imply the visible expression of a cosmological ideology, in a spatial organization which was also

Table 3.6.1. Various characteristics of Tongarevan *marae* examined in Chapter 3

	(Section 3.2)			(Section 3.3)						(Section 3.4)		
					variations in location							
TON-No.	size (m²)	location (1)	spatial assication with settlements	names of supposed districts	center of district	boundary of district	satellite islet	blackish inlet (fishpond)	tauranga ruhi	locations of islet (2)	morphological type (3)	orientation (4)
(1)	-	-	-	Motuunga	-	-	-	-	-	W	-	-
2	553	L	-	Tokerau				X		N	A	L
4	610	M	-	Ruahara				X		N	B	O
6	625	O	-	Tausoata / Rukutia						N	?	O
7	468	O	-	Hanoa						E	B	O
(8)	-	-	-	Tautua	-	-	-	-	-	E	-	-
9/II	598	O	secluded ?	Motunono?	X?					E	B	O
10/I	804	M	secluded ?	Temata	X?			X		E	B	O
11	874	M	-	Patonga				X		E	A	O
12	793	O	-	Rupu						E	B	O
15/I	611	O	secluded ?	Atutahi	X?					S	B	O
16/I	476	S.I	-	Tepuka?			X		X?	S	B	P
16/II	367	S.I	-	Tepuka?			X		X?	S	B	P
16/III	-	S.I	-	Tepuka?			X		X?	S	B	?
19	786	L	secluded	Tevete?						W	A	O
20	856	L	secluded ?	Tevete?						W	A	O
21	1425	O	secluded	Tevete?			X		X	W	A	O
22	383	L	-	Motukohiti		X				W	A	S
25	1592	O	-	Omoka					X	W	A	O
27	-	L	within settlement?	Mahera?	X?			X		W	?	?
28/I	600	O	secluded	Tevete?	X					W	A	O
29	692	L	-	Hakasusa		X				W	A	O
33	564	O	secluded ?	Tepuka		X				E	B	O
37	1038	S.I	-	Atutahi		X?	X		X	S	B	O
46	-	L	secluded	Tevete?						W	A	L

(1) L: lagoonside, O: oceanside, M: middle of islet, S.I: small islet.
(2) W: western islet, E: eastern islet, N: northern islet, S: southern islet.
(3) A: Type A *marae* with a platform, B: Type B *marae* with double stone arrangements.
(4) L: *marae* orientated toward the lagoon, O: toward the ocean, P: toward reef passage, S: parallel to shoreline.

interrelated to economic and social meanings.

Secondly, I discussed the role of *marae* as symbols of districts and as territorial markers, by setting out the relationship of *marae* with districts and the various locations within their territories. In each district, ceremonies at *marae* would provide one of the few opportunities the people had to meet together. Through such ceremonies, they would confirm their participation in, or their affiliation to, the district. Some of them could display their superior status by playing special roles in the ceremonies. We can thus consider that construction of a *marae* was a symbolic action which served to unify household units that were economically self-sufficient and independent.

Given that the above meaning of *marae*, a symbol of a district, was related to internal affairs of the district, the role of *marae* as territorial markers can be viewed as being related to external relationships. While temporal and unstable alliances were formed, the Tongarevan socio-political system in late prehistory is mainly characterized by autonomous districts. No single authority occurred to legitimize territory of a district. Therefore, each district would need to express its legitimacy by itself, particularly as conflicts had enhanced political tensions in late prehistory. In summary, there is the likelihood that for a district constructing a *marae* was a symbolic expression of its legitimacy.

Finally, I examined the morphological variations of the inner component of the *marae* and their prevailing orientation, and discussed the meanings encoded within them. We can classify Tongarevan *marae* into two types, Type A *marae* which has a platform and Type B *marae* which has a double stone arrangement. Of interest is the fact that *marae* of each type tend to be unevenly distributed throughout the atoll, Type A on the western islets and Type B on the eastern islets. By using ethnohistoric accounts to form a relevant context, I interpreted this distribution pattern by linking districts to either genealogical line of two founding ancestors, Taruia and Mahuta.

With regard to orientation, Tongarevan *marae* tend to be directed toward the ocean. Ethnographic accounts of cosmological beliefs are quite limited for the atoll. However, referring to those from other Polynesian islands, we can speculate that this tendency was related to a prevailing belief in the sacredness of the ocean.

The above discussions are not detailed enough to elucidate all possible meanings encoded in Tongarevan *marae*, and there are probably many meanings than those discussed. This chapter, however, makes it evident that Tongarevan *marae* were richly polysemic. In constructing *marae*, the people would impose various meanings, including economic, social, political and cosmological, on it.

Most *marae* had shared several meanings, and these meanings imposed common architectural characteristics. This is certainly the case with the orientation of *marae* toward the ocean, and probably also with the secluded location. The rectangular courtyard and uprights are also such characteristics. There are variations in the form of the inner component, but these variations are not unique characteristics observed only in a specific district. Each variation provides almost half of the Tongarevan *marae* with a common appearance.

It is, however, incorrect to state that there are no characteristics purely exhibiting local meanings. For example, several *marae* are enclosed by curbstones and uprights, but others are only edged by uprights standing along the periphery. Certain variations are also discernible in the shape of the uprights. The permutation of these variations makes each *marae* somewhat unique. Given that most *marae* were constructed in late prehistory, as with some dated sites (Section 3.1), it is likely that such morphological uniqueness was related, not to changes over time, but rather to local meanings peculiar to each district.

What is most intriguing about these local meanings is the variety in

marae locations. Most *marae* are consistently located in secluded places where subcanopy and shrub species such as *Pandanus tectorius* and *Pemphis acidula* are predominant. This is, however, not necessarily the only marked feature of *marae* locations. Changing our viewpoint leads us to other features. By focusing on districts' territories, we can identify several *marae* adjacent to boundaries, with others lying in the heart of territories. There are also *marae* on small islets which appear to have been satellite territories of some districts. Again, these features illustrate the possibility that the people expressed various concepts of their territoriality by constructing marae.

Turning our attention to valuable resources other than coconut trees, we know that several *marae* are close to Milkfish ponds of or fishing points for Black Trevally (*tauranga ruhi*). Because of the economic value of these fishes, it is likely that several *marae* also expressed the exclusive exploitation of such resources by particular districts. In a broad sense, we would be also able to view such *marae* as territorial markers.

In short, the meanings above enumerated can be divided into two categories. One consists of local meanings peculiar to specific districts. The other consists of common meanings shared by most, or at least many, districts. Tongarevan *marae* exhibit meanings from both categories, as these structures served as internal symbols to unify the people within specific districts, while they were also external symbols which expressed the district's legitimacy to other districts.

Notes to Chapter 3

(p. 46) [1] In my archaeological monograph published in 1995, twenty-two sites of rectangular *marae* were described, but another small *marae* (TON-46) facing to

the lagoon was discovered during the 1995 field survey. In addition, Bellwood reported that there was a structure having curbed lines and two uprights within TON-27 settlement in the islet of Mangarongaro (Bellwood 1978: 182). He supposed it to be part of a *marae*. While the structure is heavily disturbed, I include it as a rectangular *marae* in this thesis. On the other hand, I could not find TON-20/I *marae* reported by Buck (1932a: 171) despite extensive exploration, while I identified TON-20/II *marae* reported by Bellwood (1978: 171). For this reason I have excluded TON-20/I *marae* from discussions in this thesis. Therefore, the total number of *marae* is now twenty-three.

(p. 46) [2] In the Tuamotu Islands, however, *Marae* Mahina-i-te-ata (Site 6) on Takaroa Atoll has uprights along both left and right sides as well as on the platform (ahu), which is (Emory 1934a: 7 and 32).

(p. 48) [3] Similar structures — notably to the second group of non-rectangular courtyards — are known in Tikopia. *Kava* ceremonies were performed at these sites, called *marae* in the island. They appear to have been culture-historically related to the semi-circular courtyards (*alofi*) used for the formal drinking of *kava* in West Polynesian societies (Kirch 1996: 268).

(p. 56) [4] The suggestion regarding dates obtained from turtles was provided by Dr. Steve Robertson, Quaternary Dating Research Centre, Australian National University.

(p. 56) [5] As Bellwood (1978: 178-9) pointed out, TON-21 *marae* closely resembles two sites in Malden Atoll (*marae* B and C in Site 1) in the Line Islands lying 650 km north of Tongareva, although these *marae* only have uprights at the rear of the main court (Emory 1934b, 1970).

(p. 59) [6] Buck listed another *marae* named Punaruku (TON-14), which, he stated, had been within the boundaries of the missionary village at Tepuka and completely demolished (Buck 1932a: 167-8). Thus, Lamont' description, as such, is not enough to identify site TON-33 as the *marae* which he visited. All *marae* on the eastern islet chain including Tepuka are, however, located on the oceanside, while the ruin of Tepuka village around the incomplete church is close to the lagoon. Therefore, it appears unlikely that the Punaruku *marae*, even if it existed, was situated within the village area. TON-33 *marae* is currently the best candidate for the *marae* which Lamont visited on Tepuka (Yamaguchi 1995: 35-6).

(p. 60) [7] The δ^{13} value (2.7 ± 0.2) was obtained from a Tridacna shell (WK-4530) collected in Tongareva and dated by Waikato University. The ΔR value (45.0 ± 30.0) is based on that from the Society Islands (Stuiver et al. 1986; Stuiver & Braziunas

1993).

(p. 60) [8] According to the study of architectural features, the prehistory of Tongareva, in particular the earlier period, was likely strongly characterized by turtle ceremonies. In this respect the name of Tongareva stimulates my imagination. While the term can be translated in many ways (cf. Kloosterman 1976: 33), the sentence of "te papa o Tongareva," which is used in a chant in eastern Tuamotu, means the bottom of the sea where the turtle sinks and hides (Emory 1947: 60-1).

(p. 62) [9] The tuber of *puraka* can grow up to 13 -15 cm in diameter and 5.5 kg in weight, which is much larger than that of *taro* (*Colocasia esculenta*). It is also said to tolerate severe environments such as saline, dry and alkaline soil (Chikamori 1996: 334). However, *puraka* takes four or five years to reach maturity, and thus it can not be the staple food of people living in atolls.

(p. 62) [10] At present, the understorey of Tongarevan vegetation mainly consists of young coconut trees. This has taken place during the past 15 years or so since the collapse of the copra trade (Spencer et al. 1994: 32).

(p. 77) [11] The economic value of coconut trees is recognized even at present. We have to compensate the people with a large sum of money when we cut coconut trees for archaeological surveys.

(p. 79) [12] After ceremonies at *marae*, the people had to bathe in freshwater pools in order to remove supernatural spiritual influences from themselves (Buck 1932a: 90). Such a custom would symbolize the conceptional distinction between ceremonial spaces and those of daily activities.

(p. 79) [13] Lamont also notes that the people used some parts of the coconut tree in the ceremony performed at a *marae*. What is particularly intriguing is that young coconuts were used to drive "the devils" away from the *marae* (Lamont 1867: 121). It is possible to envisage from this account that the people symbolically transformed with coconuts — the most valued of daily foods — the sacred, terrible *marae*, which was separated from dwelling spaces, into secure places where they could safely stay during ceremonies. The similar usage of coconuts in Samoa was reported by John Williams, who noted that coconut water was sprinkled to render a sacred place common (see Moyle 1984: 156).

(p. 80) [14] However, every ceremonial structure in East Polynesia was not necessarily associated with the territory of a social group. For instance, Gerard (1974: 225) points out that the association of *marae* with particular lands held by *'ati* (descent groups) were not general although some *marae* would have served to legitimate the rights of *'ati* to particular lands. This account supports that the

meanings encoded in *marae* must be interpreted within local contexts.

(p. 87) [15] The Island Council used this sectioning of the lagoon to control and preserve (*rahui*) the stock of black-rip oysters (*Pinctada margaritifera*) which local divers collected to supply natural black pearls, through some agents in Rarotonga, to the world market until at least 1980's (cf. Sims 1988).

(p. 87) [16] This map published in 1931 has the name of "Plan of Part Penrhyn Island, Cook Group: Surveyed for the Cook Islands Administration." It is now stored at the Department of Land and Survey in Rarotonga.

(p. 93) [17] The boundary between the two districts on the islet of Mangarongaro is currently unclear. However, judging from the land names which are noted on Linton's map, Tevete would occupy the southern half of islet and Mahera the northern half.

(p. 93) [18] The *ahu* or platform of TON-46 *marae* is faced with squared limestone slabs set on edge. The location and the morphological features of *ahu* represent a great similarity to many *marae* constructed on the shore of Maeva village on Huahine in the Society Islands (cf. Emory 1933).

(p. 93) [19] This account was given by Mr. Rassumsen (a PhD student in Anthropology Department, University of Auckland) from Tongareva (Rassumsen *per. com.*).

(p. 95) [20] Another possibility is that TON-46 *marae* was related to progradation and retrogradation of shoreline. Deep lagoons (more than 50-60 m in depth), such as that of Tongareva, have the current patterns which are primarily wind-driven (Spencer et al. 1994: 20). This indicates that the current in the Tongarevan lagoon is driven from southeast to northwest by the trade wind, and thus the lagoonside shoreline of Mangarongaro, one of leeward islets, would be affected by the active process of sediment transport. This process promotes sediment deposition (progradation) at some places and land erosion (retrogradation) at others, influenced by the varied submarine topographies near the coast. Both sides of TON-46 *marae* exhibit considerable wave-erosion. It would not be surprising if the inhabitants of Mangarongaro were very concerned about the continued changes in the shoreline, and that they thought the sacred structure had the power to prevent their land from being eroded by waves.

(p. 99) [21] Information on Milkfish was provided by Mr. Fujino who in 1991 worked at the Marine Department of the Cook Islands, as a visiting scholar from the United Nations.

(p. 99) [22] The aquaculture of Milkfish in fishponds goes back at least 500 years in Java and 300 years in Hawaii (Johannes 1981: 155).

(p. 105) [23] In this section (Section 3.4), the morphological types of *marae* and the

meanings have been already discussed in Yamaguchi (1996).

(p. 108) [24] The configuration of TON-21 *marae* is, however, somewhat unique in the atoll (see Fig. 3.1.5). The most marked characteristic is that the platform is not incorporated within the court but rather projects outward from the rear of main court. Therefore, it is currently unclear whether TON-21 *marae* is the prototype of other Type A *marae*.

(p. 112) [25] The relationship between the Takatu line and the other two lines (Mahuta and Taruia) may be able to be explained in the context of the 'stranger-king' which Sahlins (1985: 73-103) discussed. Of special interest is an oral tradition of Turua, whose father was of the Taruia line (stranger chief) and his mother probably from the Takatu line (indigenous chief). It is said that he was the strongest chief, who asserted himself *ariki* of the whole atoll through his exaction of turtle tribute (Buck 1932a: 50). Such power or authority would not, however, have lasted for long in a situation where people were dispersed on many islets.

(p. 114) [26] If we looked to other islands in East Polynesia, however, we would probably find ceremonial structures exhibiting astronomical orientations. For instance, Liller (1993) points out that several *ahu* in Easter Island are intentionally aligned to solar solstices and equinoxes.

Chapter 4

Additional Case Studies: Ceremonial Structures in Rarotonga and Mangaia, the Southern Cook Islands

The preceding chapter has made it evident that Tongarevan *marae* were polysemic symbols or vehicles carrying various and interrelated meanings associated with economical, social, political and cosmological aspects of the late-prehistoric society. Scrutinizing various characteristics of *marae* on the basis of local contexts peculiar to this atoll made possible to approach those meanings. In this chapter, I examine the ceremonial structures in two islands of Southern Cook group: Rarotonga and Mangaia. They are also inferred to be polysemic in the same way as Tongarevan *marae*.

It is, however, somewhat daunting to try to prepare thick contexts or descriptions relevant to interpreting detail contents of various meanings encoded in each structure. Thus, this issue is left to future studies, and I place the focus instead on examining patterns relating to location and morphology of ceremonial structures, and on interpreting them in the socio-political context particular to each island. The results have a bearing on further examination of the various physical characteristics of East Polynesian ceremonial structures, especially when considering the diversity of socio-political meanings encoded in them.

4.1. Spatial Distribution and Morphology of Ceremonial Structures in Rarotonga, the Southern Cook Islands

The Southern Cooks comprise nine islands lying approximately 2700 km northeast of New Zealand. These islands include various types of landforms:

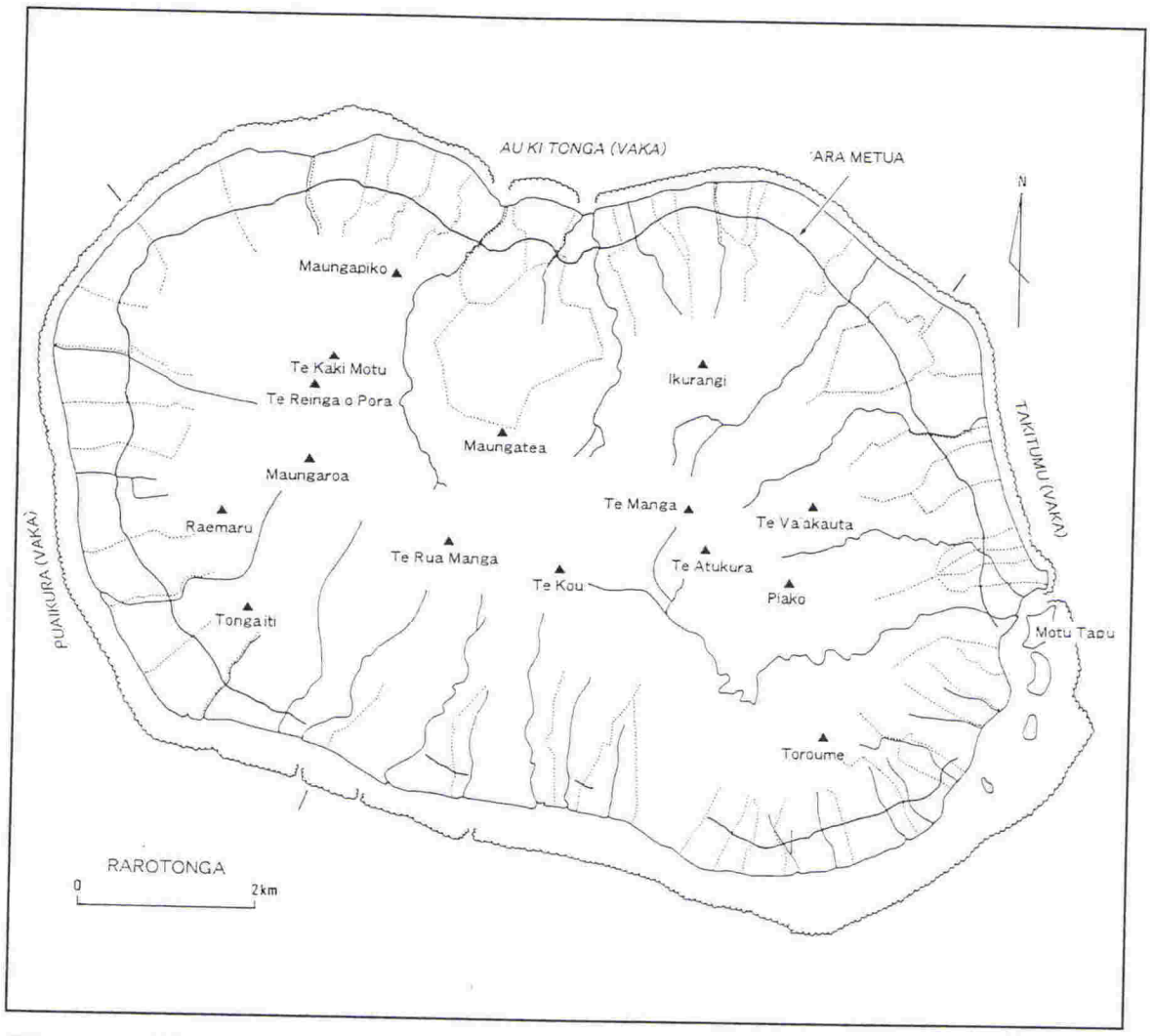

Fig. 4.1.1. Map of Rarotonga, the Southern Cook Islands

The solid lines show boundaries of the *vaka* (tribal territories), and the dotted lines show boundaries of the *tapere*. In 1990, 1991 and 1996, Keio University undertook archaeological research in two of the eastern valleys of Rarotonga. These valleys contain the two major *tapere* of Turangi and Avana (See also Fig. 4.1.12).

thus one is a high volcanic island (Rarotonga), one is a near-atoll (Aitutaki), one is a sand cay (Takutea), two are atolls (Permerston and Manuae) and four are raised coral reef or *makatea* islands (Mangaia, Atiu, Mauke and Mitiaro). Rarotonga among these islands is the highest, largest and most populous of the Cook Group (Fig. 4.1.1).

In the 1960s and early 1970s, archaeological researches were carried out on this island by two groups of the Canterbury Museum (Trotter 1974) and

the University of Auckland (Bellwood 1978), which resulted in the first summary of site distribution. Among these data, the spatial distribution of architectural features on the slopes of the Maungaroa Valley, located in the western part of Rarotonga, has been most frequently discussed in settlement pattern studies (Bellwood 1969, 1971, 1979). The early missionaries, however, reported this valley as the settlement of the weakest district which was subject to oppression from its more powerful neighbours (Williams 1832: 172). Maungaroa Valley therefore must be treated as a settlement formed under rather unique conditions within Rarotongan ethnohistory. Thus, it may not be an area reflecting the typical characteristics to the distribution pattern of architectural features and their morphological variations observed elsewhere in Rarotonga.

The second well-known distribution of architectural features is from the vicinity of an ancient roadway called *Ara Metua* encircling the island (Bellwood 1971; Wilkes 1974). A number of structures are strung out along each side of this roadway. From this distribution several architectural features have been discussed as ceremonial nodes in a 'single system' (Parker 1974: 63-4) which were unified by the *Ara Metua* traversing *tapere* (basic land divisions) and even *vaka* (tribal territories). Some ceremonial sites, however, do not lie along the *Ara Metua*, and therefore an alternative scheme which differs from a single system of ceremonial activities seems necessary to accommodate the location of these sites. One such scheme is the spatial range of *tapere*, the pie-shaped territorial unit extending from the mountainous inland to the ocean.

In 1990, 1991 and 1996, Keio University undertook archaeological field reconnaissance within the eastern region of the island which includes two valleys running along Turangi and Avana streams (in Ngatangiia District). In focusing on these two valleys, I initially try to reexamine the distribution patterns of Rarotongan ceremonial architecture, once I have described the variety of its architectural features in general.

4.1.1. Architectural Features Associated with Ceremonial Activities

Accumulating evidence has revealed a wide variety of architectural features in Rarotonga which were associated with ceremonial activities: T-shaped *paepae*, *'are kariei*, *koutu* and *marae*.

The first group of T-shaped *paepae* is characterized by a rectangular paved platform with a pathway intersecting it, that takes the form of the letter "T". Five sites are classified as belonging to this group. These structures constitute the front spaces in the houses of high chiefs. Frequently they carry several stone seats assigned to traditional high chiefs (*ariki* and *mata'iapo*) who ceremonially consumed *kava* and conducted their tribal councils there on formal occasions (Duff & Duff 1974).

Only one architectural feature is archaeologically identified as an *'are kariei* (or *'are karioi*). This is site RAR-49. While this site is heavily damaged, it still reveals a complex arrangement of curbstone lines, and would have been provided with a platform running across one end (Wilkes 1974). An ethnographic account indicates that one *'are kariei* was a large rectangular house measuring approximately 30 m by 9 m in size (Smith 1903; Wilkes 1974). At such structure, the people rehearsed all ceremonial dances (Savage 1962: 89). This account implies that *'are kariei* were related to ceremonial activities, at least to same degree, as were T-shaped *paepae*, although they were mainly used as the place for entertainment such as tribal feasting (Savage 1962: 41; Buse 1995: 73).

The *koutu* and *marae* are associated with more purely ceremonial activities. Three sites have been reported as *koutu*, and twenty-one sites as *marae* (not counting those in the Maungaroa Valley). Ethnographic accounts describe *koutu* as structures where investiture ceremonies of high *ariki* were held (Duff 1974a). These structures were also the 'royal courts' of *ariki* where all offerings to gods were first assembled prior to being conveyed to each *marae*, on which the annual feasts of first-fruits were held (Savage 1962:119).

In addition, *marae* also served as sacred structures which were used for ceremonial and religious purposes.

Rarotongan architectural features vary in morphology, as is later shown in detail. However, they obviously involve at least some of basic elements which have been thought to be characteristics of ceremonial architecture in the Eastern Polynesia: a court (sacred area), uprights in or along court (position makers for persons attending ceremonies), or a platform (focal point of ceremonies). Such archaeological evidence indicates that some concepts of ceremonial activities or sacredness were prominent parts of the above architectural features, and this is supported by Rarotongan ethnographic accounts. Given this viewpoint, I will include the data of not only *koutu* and *marae* but also that for T-shaped *paepae* and *'are kariei* in the following analyses of locations of ceremonial structures.

4.1.2. Topographic Zones and Locations of Ceremonial Structures

The inland portion of Rarotonga is mountainous, with some peaks rising to over 600 m, and narrow ridges fall away steeply on all flanks into deeply incised valleys. Some of the longer streams have carried huge amounts of soil derived from erosion products of volcanic rocks of the interior to the coastal zone, and there formed terraces and alluvial plains. While such a transportation, joining marine and soil sedimentation on the coast, makes Rarotongan topography complex, it can be divided into five zones (Fig. 4.1.2) which prove relevant in the analysis of locations for ceremonial architecture:

Zone 1. Sandy cays (*motu*) and beach ridges. There are four cays or islets on the present coral flat. Two of the cays are formed from coral sand and gravels, in addition to the smallest one formed on basalt rock. While these cays are distributed only along the eastern coast of the island, beach ridges or ramparts, up to 8 m high and approximately 90 m in average width, encircle the other part of coast;

Zone 2. Floodplains. The most extensive landforms along the island's the coastal margin are floodplains. Streams have built the older terraces by spreading broad triangular

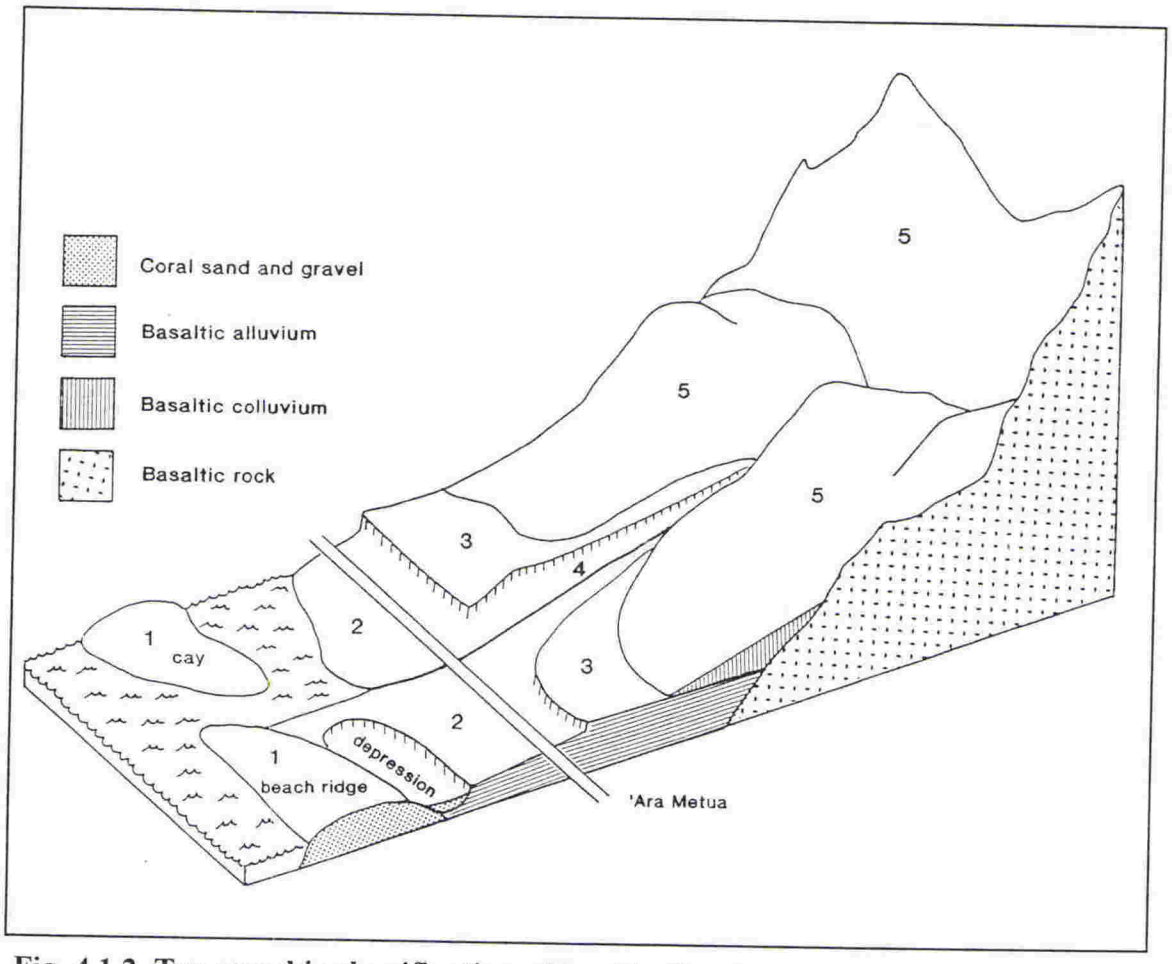

Fig. 4.1.2. Topographic classification of land in Rarotonga

This schematic figure — modified after Leslie (1980: Fig. 1) — shows various topographic features contained in Rarotongan valleys. These topographic features are relevant to setting out the variety of *marae* locations. The numbers in figure correspond to the classification in the Table 4.1.1 and the text.

shaped deposits of weakly weathered alluvium along their courses. Prominent depressions occur between these deposits and the beach ridge. Such depressions were divided into small taro beds at the European contact (Williams 1838: 207). Since for the most part of the *Ara Metua* runs on the floodplain, I divide this zone into two sub-zones (seaward side of the *Ara Metua* and inland edge of the *Ara Metua*) for convenience to discuss the location of ceremonial architecture;

Zone 3. Terraces. Old terraces — measuring approximately 10 m above sea level — attach onto the seaward margin of inland hills and mountain flanks. In the western and southern part of the island these terraces occur without stream erosion, and the *Ara Metua* runs along them. Thus, far every ceremonial structure recorded as occurring on a terrace is concentrated in the western part of the island and is located along the ancient roadway;

Table 4.1.1. Location of archaeological sites in Rarotonga

site location		site category	N	radiocarbon date [3]		
topographic zone	archaeological subdivision			related date	site code	lab. code
1: cay or beach ridge		marae	4	modern	RAR-12	Beta-131264 [4]
		early ceremonial site?	1	1030 ± 50	RAR-12	Beta-118204 [5]
2: flood plain	seaward side of Ara metua	marae	3	360 ± 70	RAR-16	N-5862 [4]
		habitation site	1	720 ± 70	RAR-40	ANU-1155 [6]
	edge of *Ara metua*	marae	10	160 ± 70	RAR-22	NZ-788 [7]
		koutu	2			
		are kariei	1	170 ± 60	RAR-49	NZ-791 [7]
		T-shaped paepae	5	240 ± 60	RAR-34	NZ-792 [7]
		habitation site	2	650 ± 50	RAR-22	NZ-789 [7]
				420 ± 60	RAR-33	NZ-793 [7]
		house platform	2			
3: terrace	edge of *Ara Metua*	marae	2			
		koutu	1			
		house platfrom	2			
4: valley bottom		marae	1			
		T-shaped paepae	1			
		settlement [1]	1			
		habitation site	1	550 ± 90	Ngt-4	N-6661 [4]
		agricultural terrace	5			
5: inland hill or ridge		marae	2	120 ± 50	RAR-105	Beta-131265 [4]
		settlement [2]	4	450 ± 60	RAR-53	NZ-796 [7]
		camp site [2]	1	613 ± 62	RAR-53	NZ-1217 [6]

A number of architectural features in them have been destroyed, but the locations of thirty-one ceremonial structures have been recorded archaeologically. Twenty-one sites are distributed along the *Ara Metua*, the ancient roadway, and others lie in various other topographic zones. (1) RAR-55 settlement area in Rutaki Valley (Bellwood 1978). (2) RAR-50, 51, 53 and 54 settlement areas in Maungaroa Valley (Bellwood 1978). (3) All dates are given in the text with the old half-life of 5568 years. The detail of dates are shown in Appendix 2. (4) dates given by Keio University. (5) This is the earliest date given by a charcoal sample which was collected in the 1997 Keio University Expedition. The detail will be published from Keio University. (6) dates given in Bellwood (1978). (7) dates given in Trotter (1974).

Zone 4. Valley bottoms. While inland valleys are narrow, several longer streams provide comparatively wide and flat valley floors around the mouths which are covered with younger alluvial soil. In places upstream river terraces made of debris flows sometimes occur and irrigated fields have been constructed on them;

Zone 5. Inland hills or ridges. Several interior peaks form a serrated pattern against the sky, and have probably prevented the people from using those zone. Elsewhere, however, more rounded hills and gentler ridges occur and some parts of these areas are covered with ferns and shrubs. This suggests that the people have used them for dry land agriculture.

While most ceremonial structures were deserted during the early Christian period and have since been disturbed by agricultural activities, the locations of thirty-two sites — not counting architectural features in Rutaki (RAR-55) and Maungaroa valleys (RAR-50, 51, 53 and 54) — were recorded: 6 T-shaped *paepae* 1, *'are kariei*, 3 *koutu* and 22 *marae* (Table 4.1.1). Twenty-one of thirty-two sites — including *koutu*, *'are kariei*, and T-shaped *paepae* — are strung out along the *Ara Metua*, the ancient roadway. The other three ceremonial sites occur on floodplains, but they lie more than 100 m distant from the *Ara Metua*. The remaining eight sites — 1 T-shaped *paepae* and 7 *marae* — are lightly distributed among the other various topographic zones such as a sandy cay formed on reef flat, beach ridges, valley bottoms and an inland ridge.

4.1.3. Political System and Ceremonial Structures along *Ara Metua*

In ethnographic accounts most sites assigned to the *koutu* and T-shaped *paepae* categories are associated with chiefs' titles of *ariki* or *mata'iapo* who formed an important part of Rarotongan political system (Bellwood 1971:151-152; Crocombe 1964:10; Rere 1991:32). The island was traditionally divided into three *vaka*, territorial tribes (Fig. 4.1.1). Each of them was reigned over by an *ariki*. *Mata'iapo* were the heads of major lineages encapsulated within the *vaka* system. They were subject to their *ariki* in conducting the affairs of the entire *vaka* (Fig. 4.1.3).

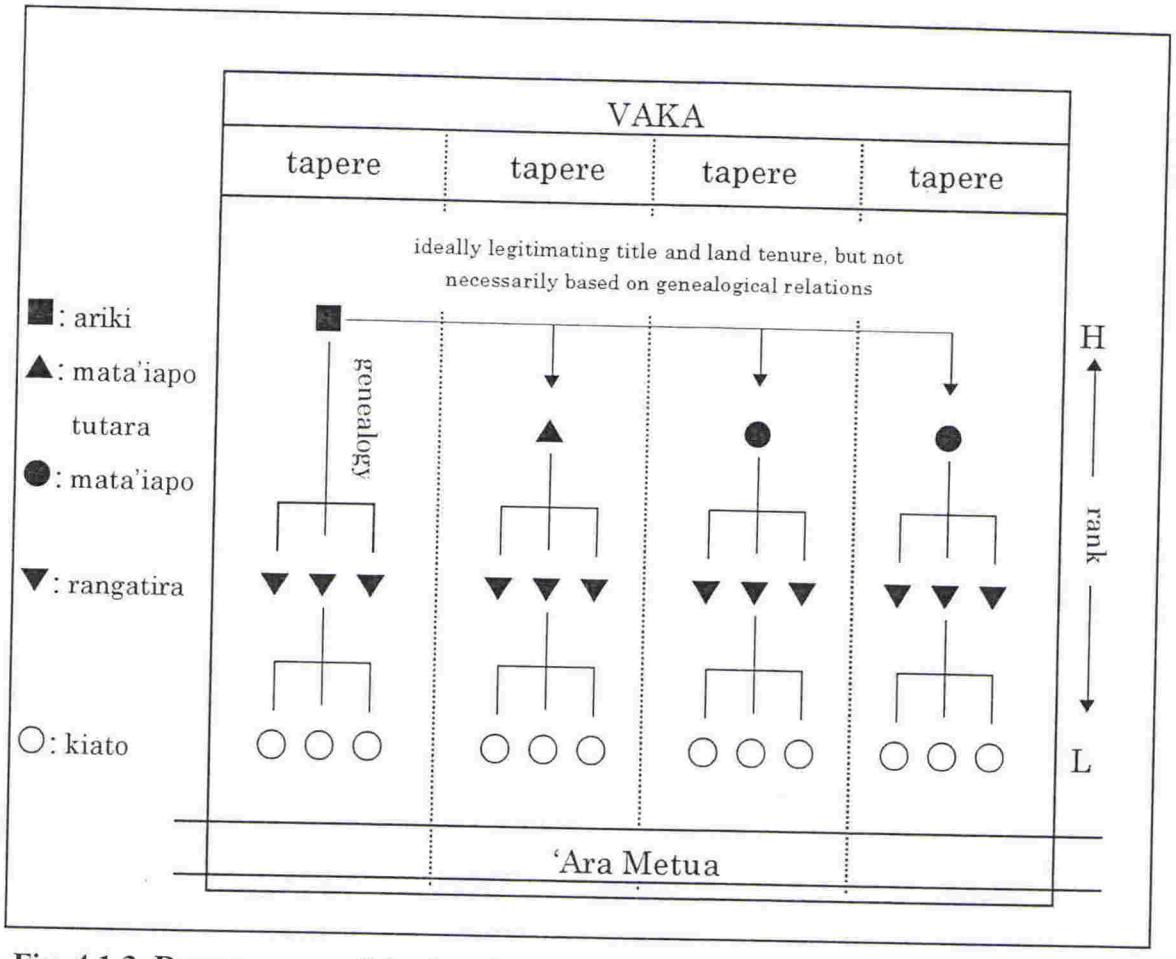

Fig. 4.1.3. Rarotongan political system

The Rarotongan political system mainly consisted of three ranks, each having titles (see Rere 1991:32). The *Ariki* was the highest rank in a tribe (*vaka*), the *mata'iapo* were heads of sub-tribes or lineages (*ngati*) and controlled the *tapere* (basic land divisions in the *vaka* territory), and the *mata'iapo tutara* acted as the representative for all the *mata'iapo* in dealing with the *ariki*. The *rangatira* were the heads of lower order branches (also called *ngati*) of either the *ariki* or *ariki* lineages. The *kiato*, the members of each lineage, were the heads of minor lineages consisting of several households (*kainga tangata*). The *Ara Metua* (traditional road) runs across every *tapere*, and should combine *tapere* in a single political system within each *vaka*.

Basic land divisions within tribal territories (*vaka*) were *tapere*, i.e. strips of land ideally extending from the mountainous inland to the ocean (Fig. 4.1.1). Most of them were under the control of *mata'iapo*. Lesser chiefs having the title of *rangatira* were heads of lower order branches among *ariki* and several *mata'iapo* lineages. The *ariki* ideally legitimated titles and land tenures for *mata'iapo* and *rangatira* within the *vaka* territory. And, in return for this, the latter two provided food tribute and rendered certain service required by their *ariki*, although *mata'iapo* enjoyed a great measure of

independence as far as their part in lineage affairs were concerned (Crocombe 1964: 40, Rere 1991: 33).

In order to discuss the Rarotongan political system, it is necessary to refer to the traditional roadway called *Ara Metua*. This roadway either runs on the floodplain or on the old terraces which are most suited to cultivating dryland tubers and tree crops, and which include arable lands (depressions) of wet taro. Thus, it furnishes excellent accessibility to fields for the essential crops of the pre-European period: taro, yam, sweet potato, banana, breadfruit and coconut (Whistler 1990: 353). As Bellwood (1971: 149) notes, the roadway runs along the ecotone between the major resource zones.

The *Ara Metua*, of course, should be expected to be important in the political realm as well as in its economic role. While *tapere* are not only the basic land sections but also basic political units reigned by *mata'iapo*, in late prehistory they were integrated into one of three *vaka*. It is likely that this political system was formed around or enhanced by *Ara Metua*, since the roadway — traversing *tapere* — served as a physical line of access promoting inter-*tapere* networking within each *vaka*. It is therefore plausible that the T-shaped *paepae* (dwellings of *ariki* and *mata'iapo*), the *koutu* (ceremonial place of *ariki* investitures), the *'are kariei* (tribal meeting places) and several *marae* which are distributed along *Ara Metua* functioned as political as well as ceremonial nodes within *vaka* or sometimes even of the entire island (cf. Walter 1996a: 85).

4.1.4. Locations of Other *Marae* — Its Topographic Features —

The remaining ten sites are distributed on locales not spatially associated with the *Ara Metua*. This illustrates that the location of Rarotongan ceremonial architecture can not be reduced to a single factor. We need other schemes along with the above 'road way' political system in order to explain why each ceremonial site was constructed at a given locale. One

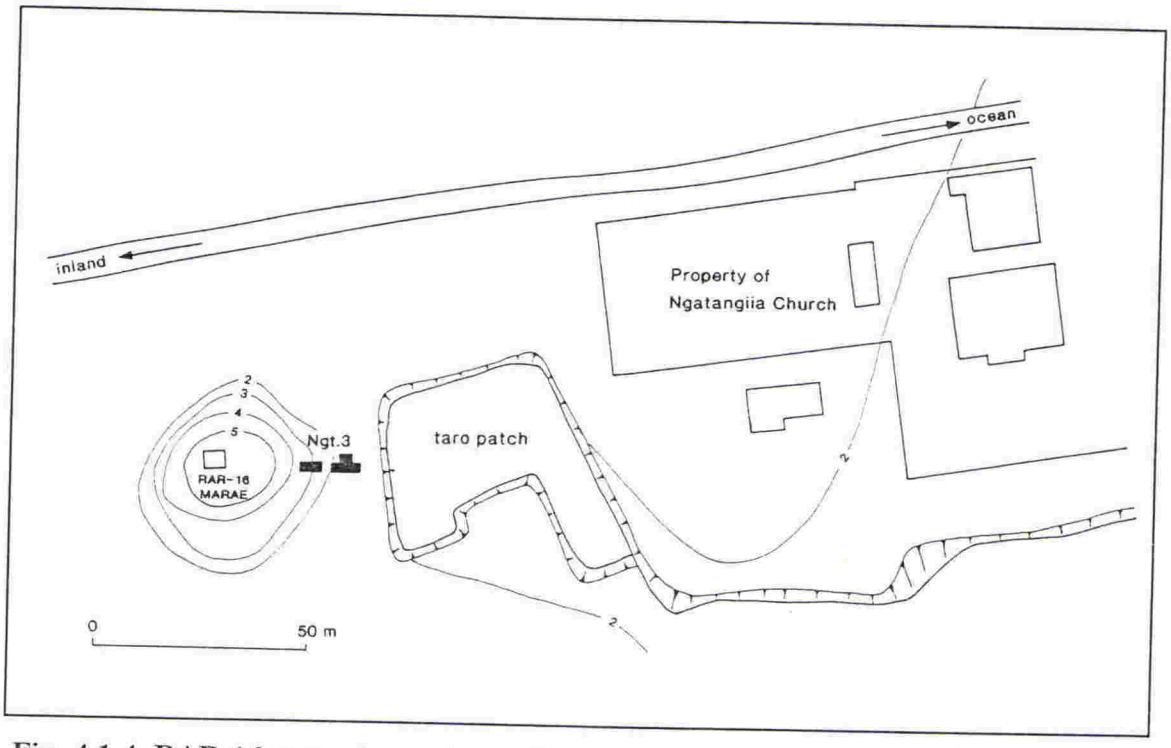

Fig. 4.1.4. RAR-16 *marae* located on a floodplain, the eastern region of Rarotonga
This *marae* has a platform positioned on a mound. The excavation (Ngt-3) revealed that the base of mound consisted of weathered basaltic rocks and was covered with the alluvium. This indicates that the base rocks piled up there naturally prior to the accumulation of alluvium soils, and would have been a small residual hill from a Pleistocene terrace. Layer 3 of Ngt-3 containing many basalt flakes was dated 360± 70 yr. BP (N-5862) (see Appendix 2).

such approach draws on an examination of landscape around these sites.

Three *marae* which are not spatially associated with the *Ara Metua* lie on the floodplain (Table 4.1.1). Two of them adjoin streams (the RAR-48 and 104). In particular, the platform of RAR-48 *marae* borders on the edge of Avana Stream, and it's long axis lies parallel to the stream. While this site has no enclosure, the flat ground on younger alluvial feature widens out in front of the platform and this may be a space for the court. This positioning would suggest a support for the possibility that the people recognized the stream as an important element of landscape when they selected the locale to construct the RAR-48 *marae*.

Site RAR-16 is another *marae* on a floodplain location and consists of a

Fig. 4.1.5. RAR-9 *marae* lying on a beach ridge in the eastern region of Rarotonga

This *marae* currently consists of a rectangular enclosure of stone-piled walls, several uprights and a huge coral rock which is a piece of residual *makatea* (the raised coral flat). While the original plan is indistinct, the rock would have been conducive to the construction or formation of a *marae* landscape.

platform constructed on a mound. The mound is about 3m higher than the floodplain (Fig. 4.1.4). An excavation at its eastern edge (Ngt-3) revealed that the base of mound was formed from weathered basaltic rocks, and is probably a small residual hill from a Pleistocene terrace. The flat land extends to the north of mound, and the platform, when viewed from there, is higher and larger. In this case, I can point out two features in respect of its spatial position. The first is that this *marae* adjoins a taro patch, although it is unclear whether the patch has existed in the prehistoric period. The second — and probably more important — is that a micro-topographic feature such as the naturally-formed hill affects the *marae* landscape.

A different topographic feature is observed at site RAR-9 on a beach

ridge from which the ocean is clearly visible. While Trotter (1974: 80) only delineated "an ill-defined scatter of coral blocks and a double row of small coral slabs set on edge" for the site, there now exists a large coral rock in the area described. It is a residual part of *makatea* (the raised coral flat) supposedly formed in the Pleistocene and then gradually uplifted up to the present level (Fig. 4.1.5). This *marae* has a rectangular enclosure of stone-piled walls, and several uprights — recently restored — stand near the rock. While the original plan is indistinct, at least the coral rock would have been conducive in the formation of a landscape suitable for a *marae*.

In support of the above, Trotter reported other mounds or heaps as serving as *marae*: a vast mound of coral rubble (RAR-20), a formless heap of coral rubble (RAR-26), and a heap of large basalt stones (RAR-33). There is the likelihood that such mounds and rock outcrops — but not all necessarily entirely natural — were invested with sacredness when comprising components of *marae* landscape. This would be in keeping with the fact that various topographic features are depicted in the Polynesian mythology as associated with god dwellings or origins of natural phenomena (e.g. Kirtley 1971).

4.1.5. Mountain *Marae* and Ocean *Marae*

In the above section, several micro-topographic features were singled out, but the most marked elements of the Rarotongan *marae*-landscape would probably have been the mountains and the ocean. Discussion here relates to two *marae*, RAR-105 and RAR-12, both of which were excavated during the 1996 Keio University field expedition.

Duff (1974a: 24) has previously noted that a significant correlation obtains "between the location and concentration of ceremonial structures and the alignment of mountain peaks of district mana." In support of this, several architectural features in Tupapa Tapere — the northeastern part of the

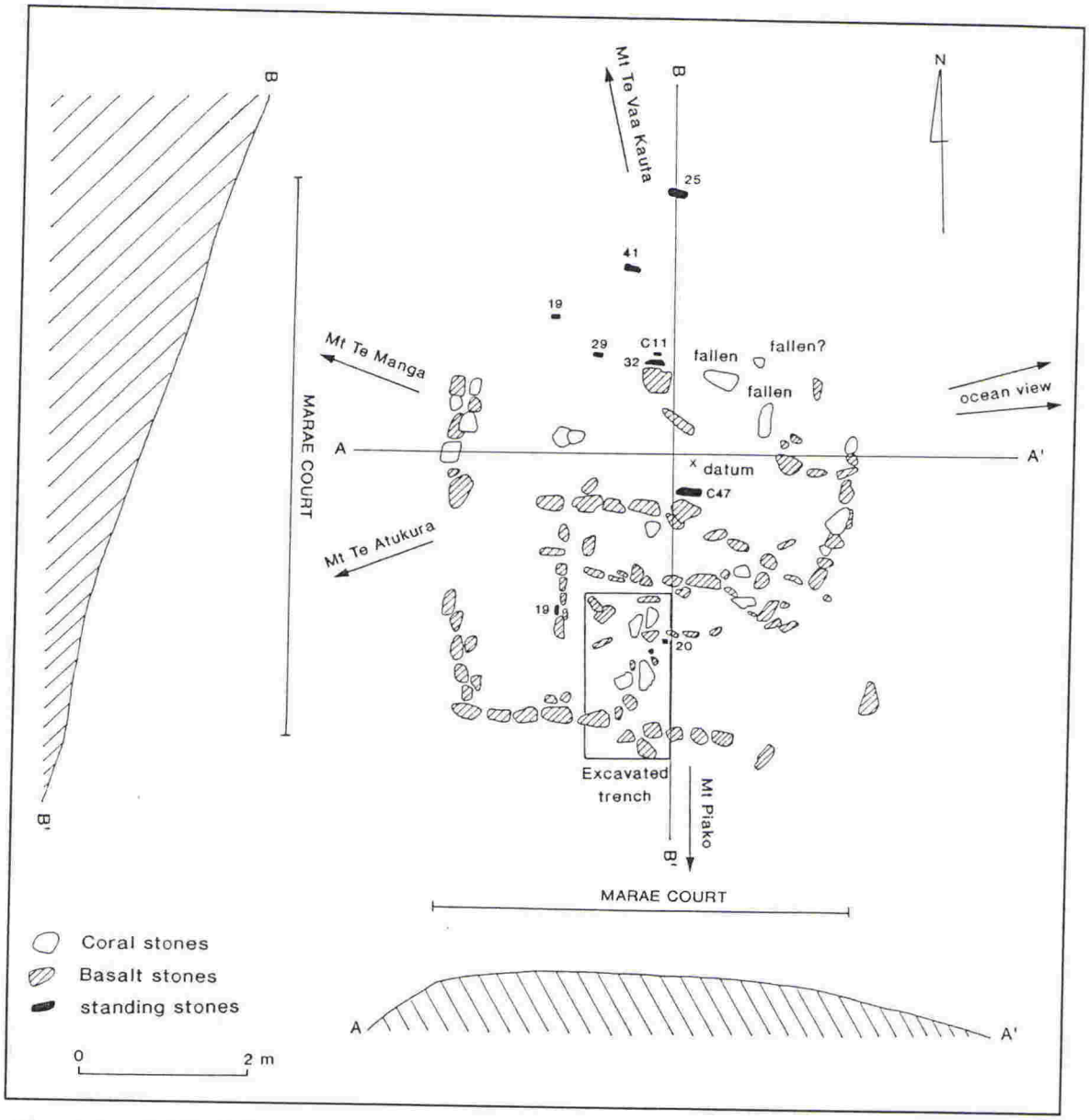

Fig. 4.1.6. RAR-105 *marae* in the Turangi Valley within the eastern region of Rarotonga

This *marae* lies on a narrow ridge, both sides of which fall away steeply to incised tributary valleys. Its landscape contains several mountain peaks which are delineated as sacred in ethnographic accounts.

island — appear to be oriented to Mt. Te Manga which is the highest peak in the island. Another case directly indicating such a correlation involves site RAR-105, a *marae* lying at the upstream end of the Turangi Valley in the eastern region of island. It lies approximately 2 km inland from the *'Ara Metua* and is located on a narrow ridge which is about 5 m wide and inclined

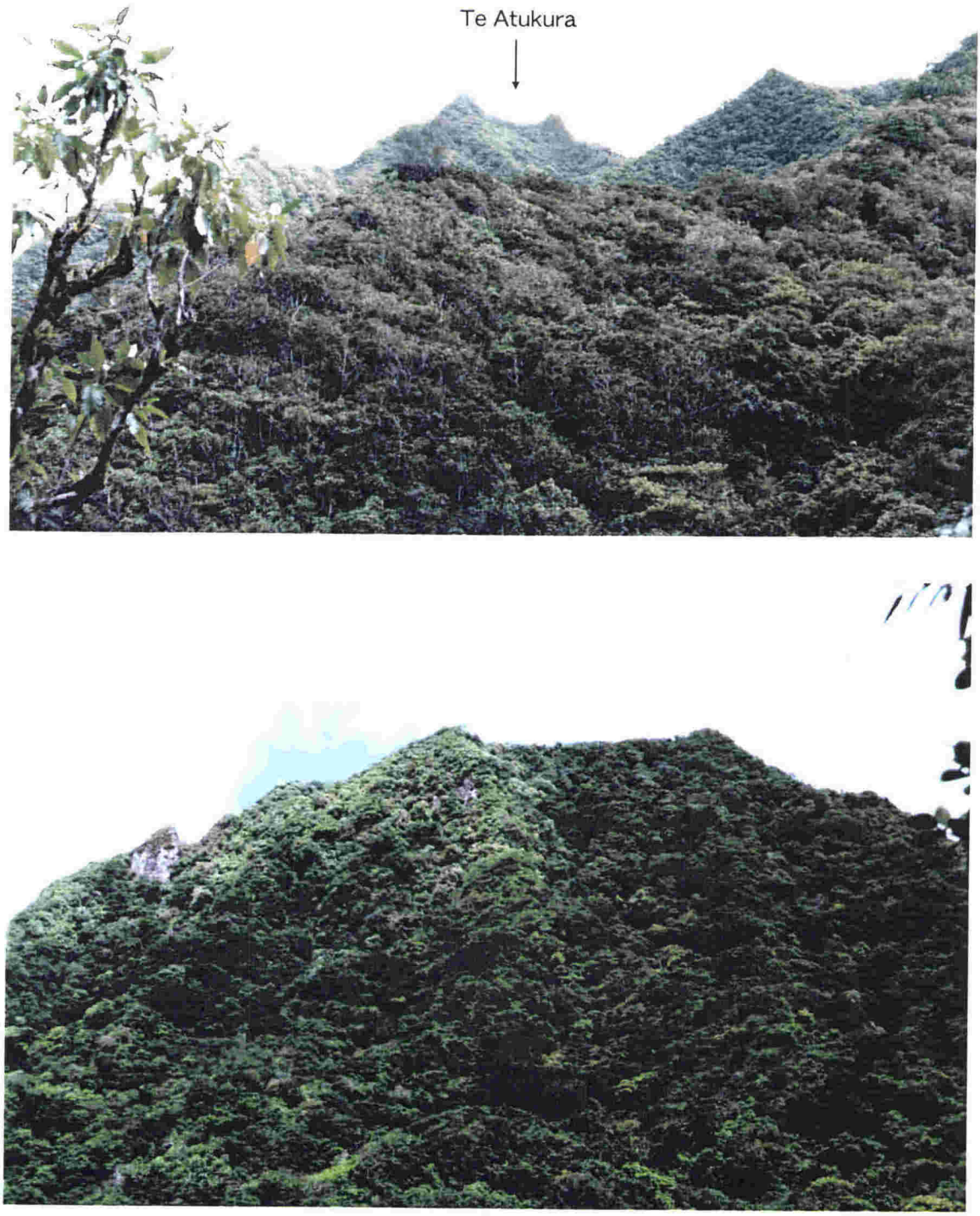

Fig. 4.1.7. Sacred mountain peaks taken in the landscape of RAR-105 *marae*

The upper photo is of the twin peaks of Mt. Te Atukura rising at the left side of RAR-105 *marae*, and the lower photo shows the massive peak of Mt. Piako close to the front of *marae*. Both mountains are depicted as sacred features in ethnographic accounts.

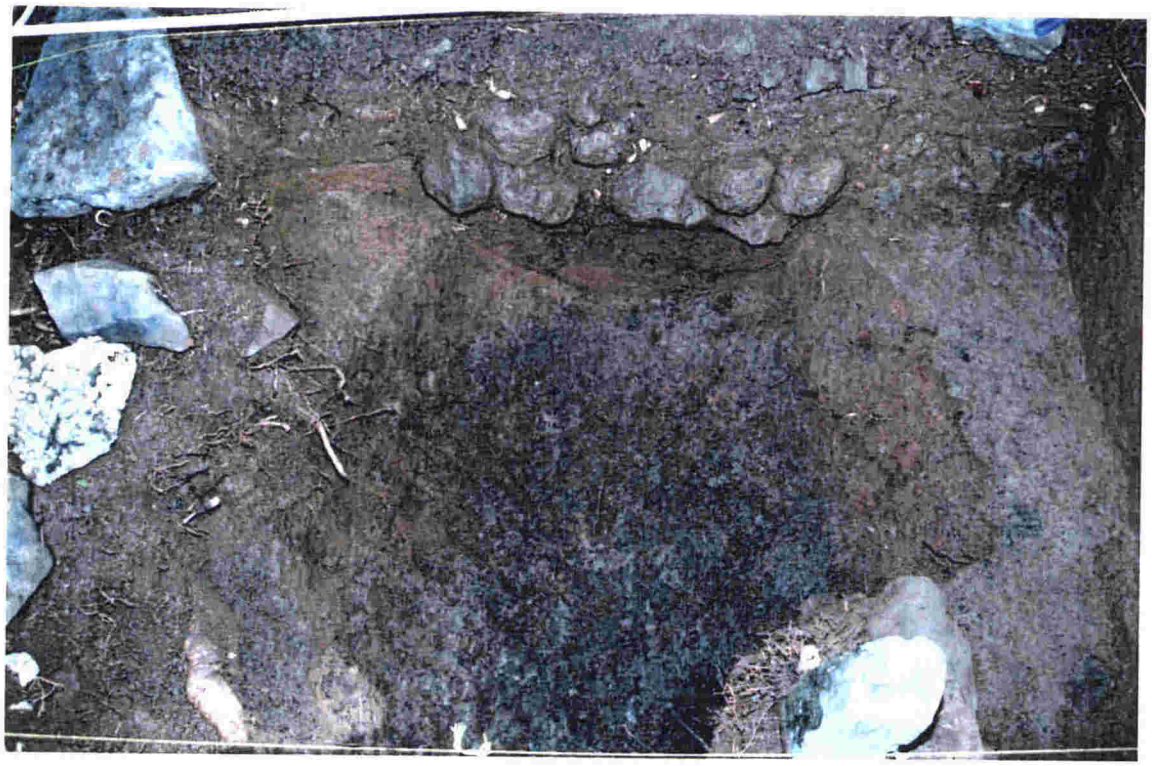

Fig. 4.1.8. Pit oven (*umu*) exposed within RAR-105 *marae*

This photo shows the bottom of oven and the section of trench wall on which *umu* stones are stuck. The oven contained no faunal and floral remains. The charcoal sample wad dated 140 ± 50 (Bata-131265) (see Appendix 2).

about 16 degree in average dip (Fig. 4.1.6). Both sides of the ridge fall away into deeply incised tributary valleys. From the *marae*, which is on an elevation more than 200 m above the sea, several higher peaks such as Te Manga, Te Atukura and Piako can be clearly viewed. The twin peaks of Mt. Te Atukura, in particular, rise just to the left of the *marae* (Fig. 4.1.7). More important is Mt. Piako to the front of the *marae*, where all of its uprights face to the massive peak (Fig. 4.1.7). In short, the RAR-105 *marae* involves within its landscape two mountains which are sacred peaks of the Takitumu tribe occupying the eastern region of Rarotonga (Duff 1974a: 24).

An excavation of 2 m by 1 m trench within this *marae* exposed a pit oven (*umu*) with many flecks of charred wood beneath a dense packing of volcanic

stones which have been oxidized red by heating on their outer surface (Fig. 4.1.8). The depositional context indicates that the oven pit is contemporary with this *marae*. No faunal remains were retrieved by dry sieving with 5.6 mm meshes. Nor were any floral remains, including nut shells, found — only flecks of charred woods — even though Pacific "chestnut trees" (*Inocarpus fagifer*) grow in great numbers in the valley. These data suggest that something not easily recovered from on archaeological context — such as tubers — had been cooked in this oven.

Of special interest in this light is the fact that there are some discarded agricultural terraces at the upstream end of Turangi Valley (Fig. 4.1.12). Thus, RAR-106 — one of these terrace sites — lies right at the junction between the main and a tributary stream, and is adjacent to the foot of ridge leading up to RAR-105 *marae*. Two other terrace sites, RAR-107 and 108, are also less than 200 m distant from site RAR-106. It would seem quite conceivable therefore that wet taro harvested from the agricultural terraces was the tuber being ceremonially cooked and offered to gods at RAR-105 *marae*.

In marked contrast to the mountain *marae* just discussed, site RAR-12 lies on Motu Tapu, a cay which is 600 m long and 360 m wide. It is separated by approximately 200 m of shallow lagoon from the east coast of main land. This cay consists of coral gravel and sands on reef flat (Fig. 4.1.9). Its seaward coast is edged with a long narrow zone of *Scaevola* shrubs (local name: *nga'u*) growing up to 4 m tall. The vegetation is gradually replaced on the inland side by a dense woodland of *Hibiscus tiliaceus* (*'au*) 6-8 meters tall, interspersed with some *Guettarda* (*ano*), *Morinda* (*nono*) and *Casuarina* (*toa*) trees. The more interior portion of the cay is dominated by higher coconut trees (*niu*) along with *Hernandia nymphaeifolia* (*puka*) and *Morinda citrifolia* (*nono*) trees, although naturalized pawpaw trees (*Carica papaya*), which were recently introduced, also thrive there at present (Stoddart 1972: 3).

Motu Tapu *marae*, site RAR-12, occurs in the flat space about 3 m above

Fig. 4.1.9. Cays or islets formed on coral reef flat

The eastern region of Rarotonga contains four cays, which are approximately 200 m separate from the mainland coast. The upper cay is Motu Tapu. In the center of the cay, we found RAR-12 *marae* in 1996.

the sea at the middle of this cay. While Trotter (1974: 81) included the site in his list, the team of Canterbury Museum did not visit there. A Keio University team recorded and excavated this site in 1996 field season. The *marae* consists of a rectangular court surrounded by small basaltic uprights (Fig. 4.1.10). The excavation revealed that the *marae* was constructed after a period during which the humic soil had been accumulated to some degree over the flat area. This is an indication that at the time of *marae* construction the cay was also covered with coastal vegetation, much the same as it is in the present situation. If so, the outer sea fringe of the cay may hardly have been visible from the *marae*.

The excavation also revealed that stone arrangements, including a row of basaltic and coral blocks, preceded the later construction of the present

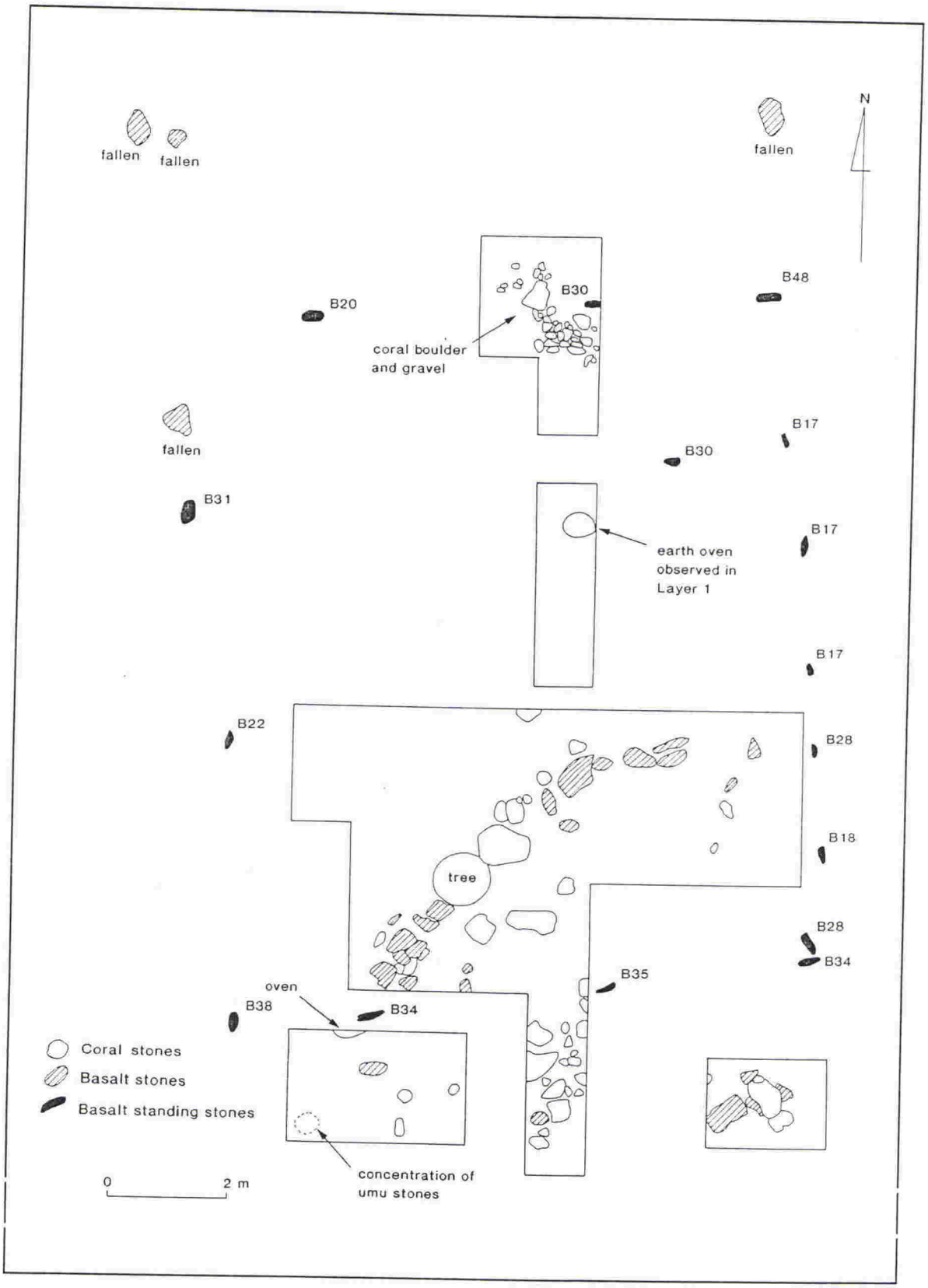

Fig. 4.1.10. RAR-12 *marae* on Motu Tapu, a cay in the eastern part of Rarotonga

This *marae* lies in the middle of the cay. The excavation revealed that the stone arrangements existed prior to the construction of the rectangular *marae* portion which was surrounded with basaltic uprights. From the humic layer, we retrieved the remains of several turtle. Turtles would have been taken with *marae* ceremonies.

marae. Several shallow depressions filled with ash and charcoal fragments were also found associated with the same layer. These depressions would have only been in very temporary use, as is illustrated by the small size and infrequency of the food remains retrieved. Thus, there are no traces of other activity to suggest that any lasting settlement exists on and around site RAR-12. Still, the stone arrangements and their rebuilding may be associated with repeated ceremonial activities, although an exact function for them is currently undetermined [1]. Given that these components lay in the gray sand just below the humic soil, their depositional condition suggests the vegetation on cay would have restricted the view but not enough to interrupt the visibility toward the ocean at the period when this site was in use.

One marked feature of site RAR-12 is the presence of turtle remains. Frequent fragments of turtle plastron were retrieved in company with ash from the humic soil. The meat associated with these animal remains would have been consumed during *marae* ceremonies. Turtle was one of sacred animals in Polynesia (e.g. Williamson 1924). It is usually claimed to have been cooked on or around the ceremonial structures, since the animal was believed to have *mana* which had to be removed through ceremonies before the flesh itself was eaten (e.g. Emory 1947:43 in Tuamotu Islands). The archaeological evidence from site RAR-12 indicates that the people there performed similar ceremonies in Motu Tapu. In support of this, an ethnographic account from this island describes a practice where every turtle which was caught must be first offered to the gods and only then eaten by high chiefs after being cooked in the sacred fire (e.g. Williamson 1924: 277).

Drawing on the contrasts between RAR-105 and RAR-12 *marae*, it is possible to abstract a dichotomy between mountains and the ocean. Thus, RAR-105 *marae* is situated on a mountain ridge which overlooks a canopy of tall trees covering Turangi valley, and has several sacred peaks involved in its landscape view. Tuberous plants — probably wet taro which were harvested from agricultural terraces in the inland valley — would be ceremonially dedicated to gods at this *marae*. RAR-12 *marae*, on the other hand, lies on a

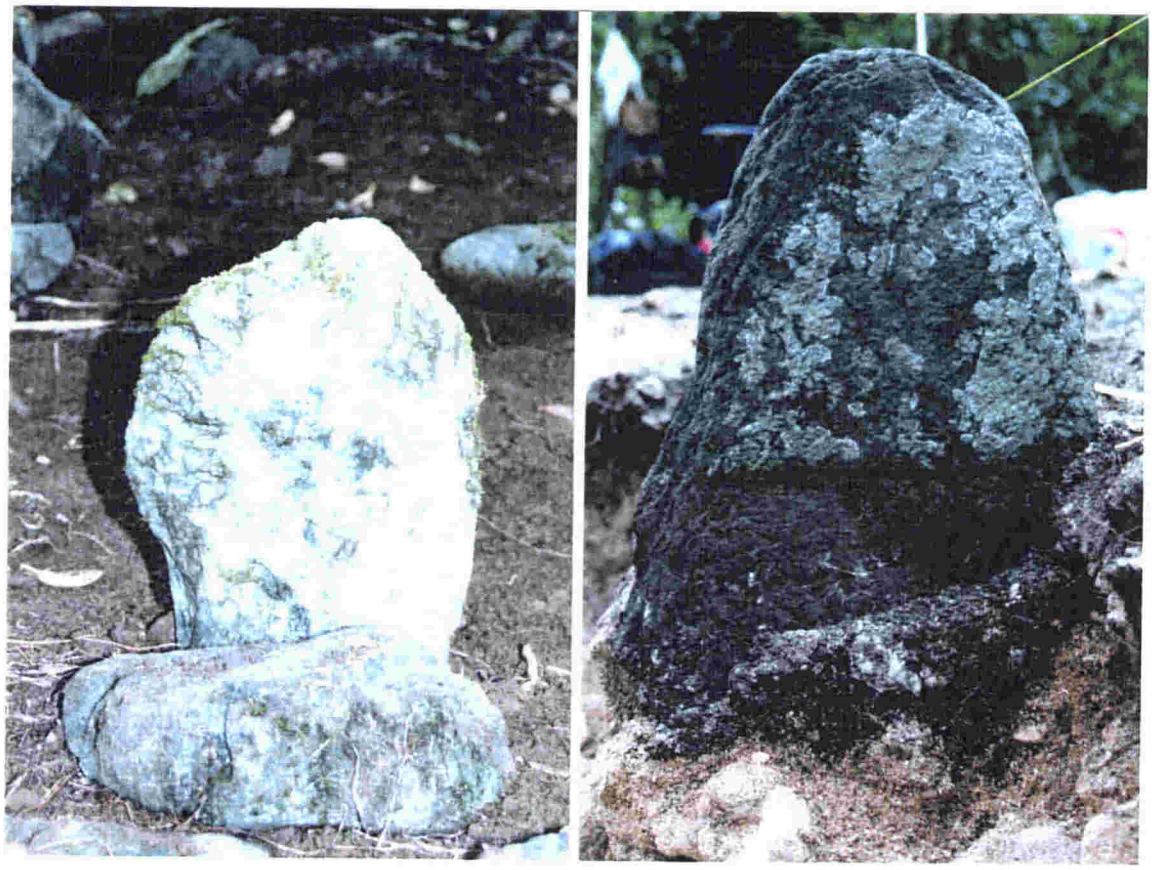

Fig. 4.1.11. Uprights standing on RAR-12 and RAR-105 *marae*

The right photo is a basaltic upright on RAR-12 (an ocean *marae*) and the left is a coral upright standing at the center of RAR-105 (a mountain *marae*).

coral cay, one of the closest land forms to the ocean. It is covered with littoral vegetation which is typical on the coast and atoll islands. It is also highly likely that turtles — periodically landing on the beach for the oviposition — were cooked and offered to gods at this *marae*. Therefore, the data from site RAR-12 strongly indicate the ceremonial association of this *marae* with the ocean.

However, the contrast between RAR-105 and RAR-12 is a little more complicated than is sketched above. Of special interest is that materials forming the uprights standing on each *marae* indicate an inversion feature (Fig. 4.1.11). All of the uprights of RAR-12 are of basalt, which is not

procurable on the coral cay. This illustrates that the people deliberately chose the basaltic stones for *marae* uprights although coral stones were readily available. In contrast to this, two coral uprights stands on RAR-105 *marae*. One of them, in particular, exists at the center of court. While Bellwood (1978: 87) reported 'there is no paving, and the surface is bare earth', we observed scattered coral gravel just under the thin surface soil. Many pieces of coral gravel were also found on the ridge slope, where they would have been eroded by rain from the court. Since it is a matter of course that coral standing stones and coral gravel do not occur naturally in the inland part of Rarotonga, they were carried up to RAR-105 *marae* from the more distant coast at least 2 km away.

Both the above sites suggest that two components are to be expected within a *marae*. The mountain *marae* is complete only with the additional elements of the ocean, and the ocean *marae* whole only when it contains an element of the mainland (or the inland). It is therefore likely that the mountain and the ocean formed an inter-complementary as well as dichotomous set in the cosmological landscape.

4.1.6. The Variety of Ceremonial Spaces within *Tapere* Territory

The *Ara Metua* roadway has been discussed as critical to the political system and the subsistence economy in the prehistoric Rarotongan society. We currently have no archaeological evidence indicating nucleated prehistoric settlements either in the inland area or on coral cays, except for the refuge settlements on the hills of Maungaroa [2]. This is in keeping with the distribution pattern of late-prehistoric settlements strung along the *Ara Metua* as it runs across the alluvial plains around the mountainous interior. Staircase-like terraces which occur along the upper reaches of streams, however, indicate that agricultural activities also took place in inland areas (e.g. RAR-57 in Avana Valley and RAR-106 to 108 in Turangi Valley). In addition, an unfinished lure point of pearl shell excavated from site Ngt-4

illustrates that deep sea ocean fishing continued even during late prehistory (Chikamori 1995b: 12). It can be inferred that the spatial range of subsistence activities extended from well inland to far out into the ocean. This spatial range would have also affected ceremonial activities. The presence of mountain *marae* and the ocean margin *marae* support this possibility.

It is essential here to point out that there is no need to refer to all ceremonial sites of Rarotonga in order to discuss their spatial range. We can approach the postulate of such a range through a site-distribution even within the river basin of one large valley. This case is that of Turangi Valley, one of eastern valleys of the island (Fig. 4.1.12). Most ceremonial spaces discussed above occur within that river basin. RAR-105 *marae* — spatially associated with irrigated agricultural terraces — lies on an interior ridge of the valley. RAR-9 *marae*, including a huge coral rock of residual *makatea* (see Fig. 4.1.5), lies at a point of beach ridge projecting out toward the cay of Motu Tapu. In addition, three *marae* and one T-shaped *paepae* are distributed on the floodplain: RAR-14 and RAR-104 *marae* at riverside locations, and RAR-24 *marae* and RAR-103 *paepae* in the vicinity of the *'Ara Metua*. In short, the riverbasin of the Turangi valley offers quite enough information to demonstrate the diversity of ceremonial spaces.

Avana Valley — contiguous with the south side of Turangi Valley — also exhibits an analogous distribution of various ceremonial spaces. RAR-12 *marae* lies on the cay of Motu Tapu. Two *marae* and one T-shaped *paepae* are distributed on the floodplain: RAR-48 *marae* facing to the stream, RAR-16 *marae* on a residual hill, and RAR-46 *marae* near the *Ara Metua*. In addition, it became evident during the 1997 expedition that an unrecorded *marae* (Ngt-7) existed on an interior ridge which is back from the modern water intake of Avana Valley. The locale of Ngt-7 *marae* is adjacent to a complex of irrigated fields (RAR-57) existing on river terraces. While having little time to explore the vicinity of *marae*, we found around that *marae* several river terraces which were probably modified for the wet *taro* cultivation. Thus, the

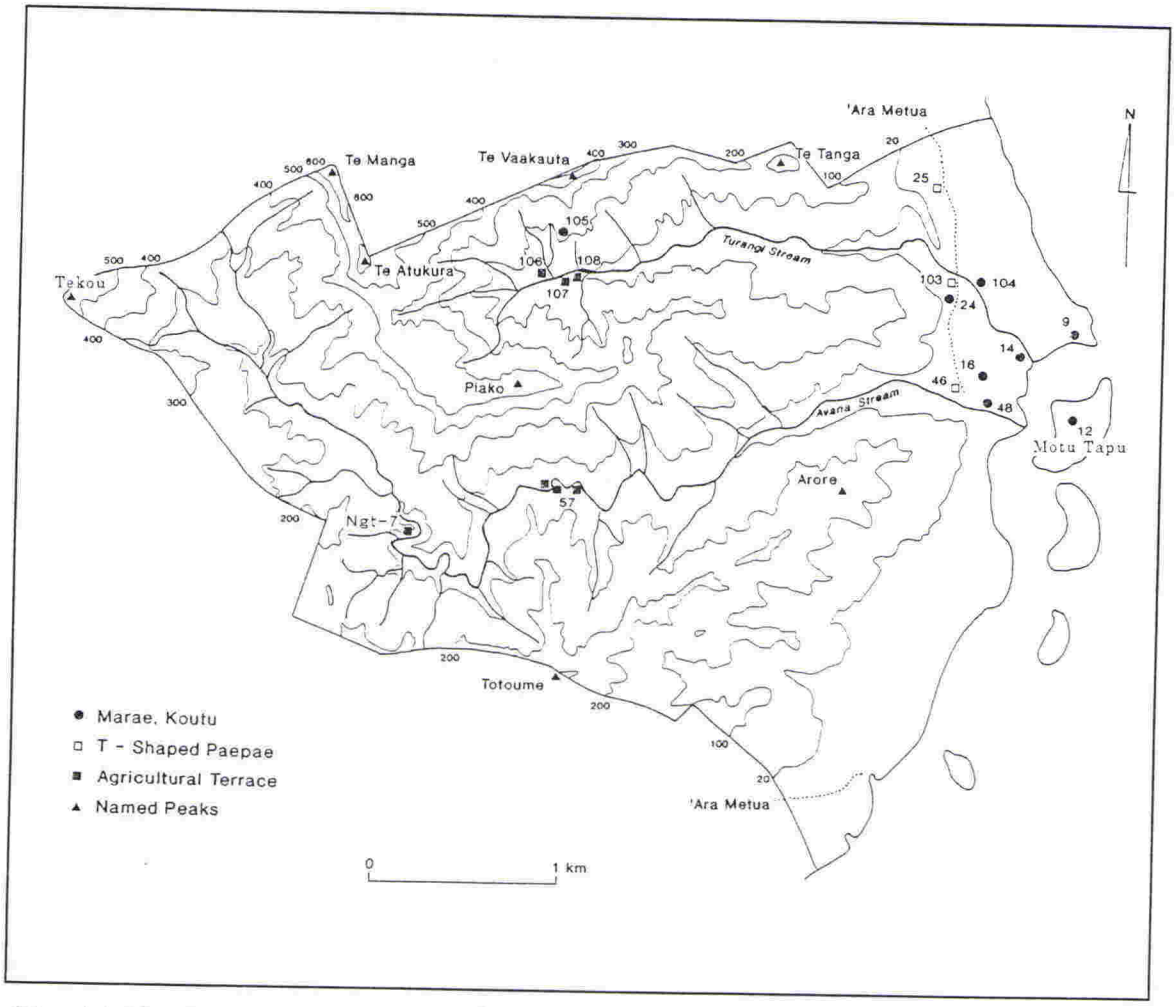

Fig. 4.1.12. Site-distribution within Turangi and Avana River Basins

It is likely that Rarotongan sacred spaces related to ceremonial activities were widely distributed within the range from the ocean to the mountainous interior. Of interest is the fact that there is no need to refer to all ceremonial sites scattered in the entire island in order to discuss such spatial range. We can observe the variety of *marae* locations within several large river basins such as those of the Turangi and Avana valleys.

site distribution within Avana Valley again suggests the spatial association of *marae* with agricultural terraces, as it does within Turangi Valley.

A variety of ceremonial spaces appear implicit in what is known of *marae* distributions in other river basins, although there are few ceremonial sites in the northern valleys of Takuvaine and Avatiu which are more populated. For instance, Tupapa Valley — investigated minutely by the Canterbury Museum — offers a good example similar to the valleys of Turangi and Avana (Table 4.1.2). Tupapa Stream has a wide and deep valley bottom, along

Table 4.1.2. Variety of ceremonial spaces within large valleys in Rarotonga (1)

ceremonial spaces		valleys		
		Turangi	Avana	Tupapa
Mauntain	ridge	x		
or Inland	valley bottom			x
floodplain	along 'Ara Metua	x	x	x
	other topographic features	x	x	?
ocean	beach ridge	x		x
	coral cay		x	

(1) Within river basin of several valleys are observable various ceremonial spaces distributed within the spatial range from the inland to the ocean. Even some sites on floodplains are spatially associated with striking topographic features such as streams, river mouths and residual hills of Pleistocene terrace.

which several irrigated terraces (still used for wet taro cultivation) are strung out up to the point where it enters the inland portion (see also McCormack & Kunzle 1995: 60). Although no ceremonial site has been reported from the interior ridges, a *marae* (RAR-27) lies at the pivot of alluvial fan which is more than 1 km inland from the coast [3]. The Trotter also listed two *marae* (RAR-20 and 26) on the beach ridge. In addition, several *marae* are distributed on the floodplain. Most of them are concentrated in the vicinity of *Ara Metua*, but some are spatially associated with the stream. The site-distribution within Tupapa Valley thus illustrates that the people selected a variety of ceremonial spaces from the nearly full range expanding from the inland to the ocean.

Each large valley was — at least in the ideal form — occupied by a single *tapere* which was the territory of major lineage headed by an *ariki* or a *mata'iapo*. In late prehistory, such a major lineage was the largest and most stable unit of land tenure. Minor lineages, headed by *rangatira*, derived their right of land use from the *ariki* or *mata'iapo*, whereas the major lineages held

land in their own right and not from some higher *ariki* heading a whole tribe and called a *vaka* (Crocombe 1964: 40). In this sense, each *tapere* was independent from its *vaka* (Crocombe 1964: 28; Rere 1991: 32). Traditional accounts outline how each of Rarotonga's three *vaka* consists of members tracing their descent from founding ancestors who traveled to Rarotonga on the same canoe (interestingly *vaka* also means a canoe). However, these ancestors are not necessarily related to each other through a single genealogy. The tribal unit functioned only infrequently, on special occasions such as exigencies of warfare and the investiture ceremonies for high *ariki* titles.

The function of *Ara Metua* traversing *tapere* is no doubt important in discussing the location of Rarotongan ceremonial architecture. It helped to establish the largest socio-political units called *vaka*, and several ceremonial structures were involved within this system as political and ceremonial nodes along the roadway. The separation of *tapere* in land holding from the *vaka*, however, indicates that the spatial range of *tapere* is essential in understanding the diversity of ceremonial spaces. Without embedding it within the first scheme or axis of analysis, we can not fully comprehend the diversity of ceremonial spaces, that existed within a single river basin. The diversity of ceremonial spaces was not the outcome of several different groups having discrete cognitive spaces. Rather, a single social group selected various locales — characterized by unique topographic features or conspicuous elements of landscape — as competent to construct their own ceremonial structures.

Finally, as an additional observation, one should note that the inventories for *marae* locations in several *tapere* occupying the larger valleys exhibit a considerable resemblance to each other (Table 4.1.2). This tendency probably indicates that some concepts of proper ceremonial spaces were shared by those *tapere*: for instance, the dichotomy between the mountainous inland and the ocean, and the sacredness of striking topographic features such as streams and huge mounds or heaps of gravel.

4.1.7. Morphological Variety within Ceremonial Structures

Archaeological investigations carried out in Rarotonga have also revealed the morphological diversity of their architectural features (Trotter 1974; Bellwood 1978). As mentioned at the beginning of Section 4.1.1, Rarotongan architectural features related to ceremonial activities can be broadly classified into three groupings on the basis of their main functions as delineated in the ethnographic accounts: T-shaped *paepae*, *'are kariei* and *marae* including *koutu*.

These architectural features commonly contain some of basic elements which have been thought to be characteristics of ceremonial architecture in East Polynesia: a court (sacred area), uprights in or along the court (position markers for persons attending ceremonies) and a platform (focal point of ceremonies). Moreover, several *marae* are provided with all three elements. They are most similar in morphology to *marae* in the Society or the Tuamotu Islands. This fact indicates that Rarotonga surely shared some concepts with other islands of East Polynesia in respect of architectural expression of ceremonial activities (Bellwood 1971:147).

However, Rarotongan ceremonial architecture, as a whole, varies in relation to particular configurations. The permutation and the spatial arrangement of the basic elements, plus the addition of yet other elements is apparent in two of the above groups: the T-shaped *paepae* and *'are kariei*. They exhibit certain discrete and specific configurations. Since these groups differ from each other in their main functions, it is not surprising that they also exhibit distinctive characteristics. In the third category the morphological variety of main elements and of the collective configurations of *marae* is very much to the fore, despite the fact that there are only a small number of *marae* which are well preserved, from which we can reconstruct several forms. First, Bellwood (1978) provides the most detailed descriptions of *marae* distributed on the upper slope of the Maungaroa Valley. He classified *marae* into five 'types' (type B1, B2, B4, B5 and B6), from which four of his cases prove to be

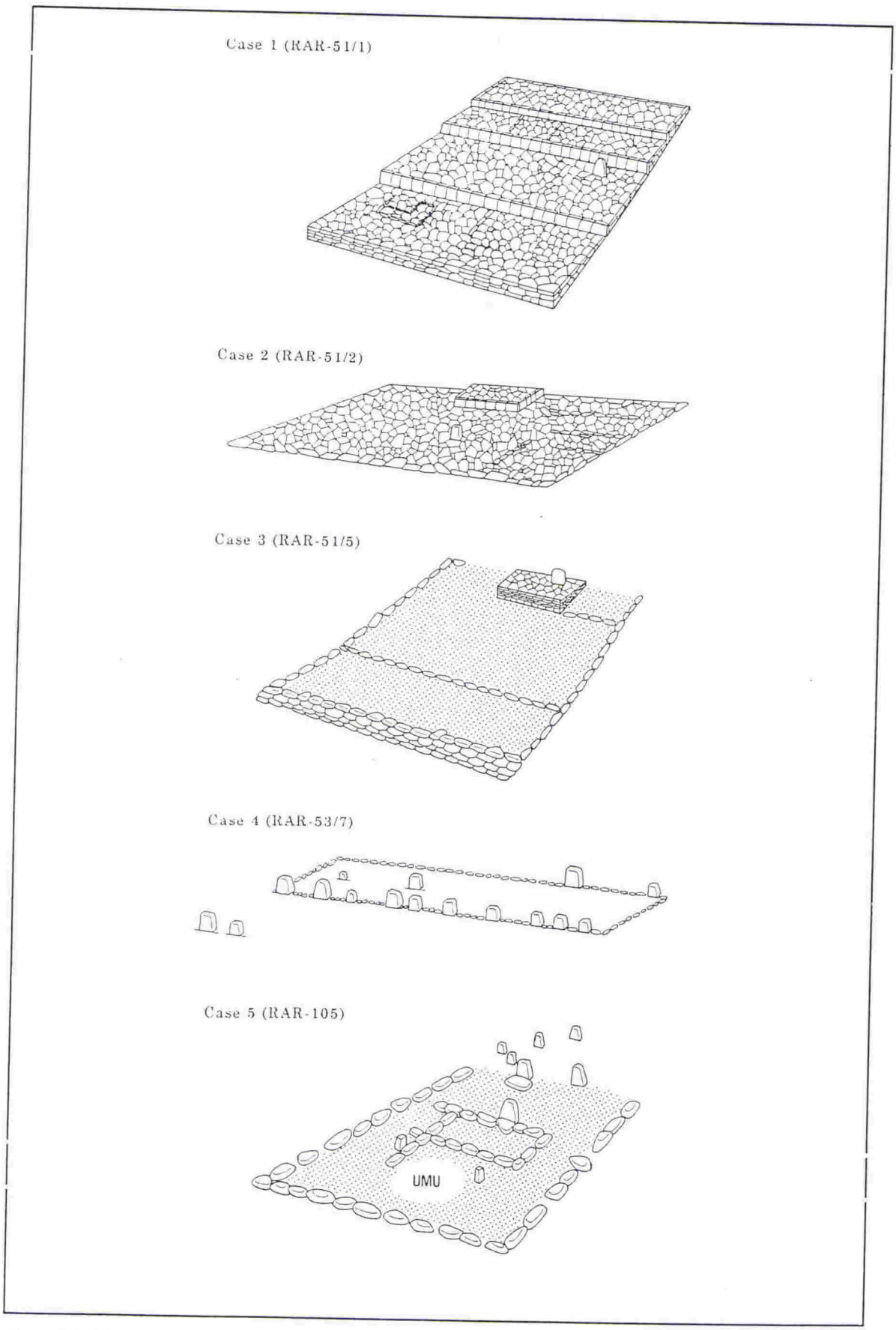

Fig. 4.1.13. Schematic reconstruction of *marae* located on mountainous interior

enough here to discuss the morphological variety of Rarotongan *marae* (Fig. 4.1.13, see also Bellwood 1969: 522) [4]:

Case 1 (RAR-51/1). Nine *marae* lying on gentle slopes have two (type B2 in the Bellwood classification) to four terraces (type B1). Each of them is paved with basaltic brecciasand has one upright either at the foot of one of the terraces or behind the upper terrace;

Case 2 (RAR-51/15). There is only one *marae* which is definitely classified as belonging to type B4. The court is defined by a trapezoidal pavement and is provided with a platform of basaltic breccias along a longer side which faces to the slope inclining down to the valley;

Case 3 (RAR-51/5). There is also only one *marae* classified as belonging to type B5. The site is in a location with an extensive sloping terrace, and the rectangular court — roughly enclosed with curbstones — is paved with coral gravel. The platform of basaltic breccias faces toward a huge natural rock at the upside of slope. The platform has a stringer of course of white coral in the basalt face. The materials of coral were obviously carried up to the site from the coast. This *marae* would have been seen as complete only by the addition of elements of the ocean, the same as RAR-105 *marae* in Turangi Valley (see Section 4.1.5);

Case 4 (RAR-53/7). Again only one *marae* is classified as belonging to type B6. It lies at the junction between the main stream and a tributary in the upper Maungaroa Valley. The *marae* consists of a number of basaltic uprights and curbstones enclosing a narrow rectangular area. Several uprights also stand within the confines of the area. While the structure is not in the form of platform, it would have been a focal point of ceremonial activity. There is, however, no trace of an enclosure such as occur around the courts of other *marae*.

The predominant *marae* in Maungaroa Valley are terraced with paved steps such as Case 1, but there also exist other *marae* exhibiting considerable differences in their collective configuration. In each case, the micro-topographic feature of a *marae*'s locale must be taken into account to fully accommodate the configuration. For instance, in Case 3, where the location is a gentle slope, the platform seeming functioned as the focal point of the

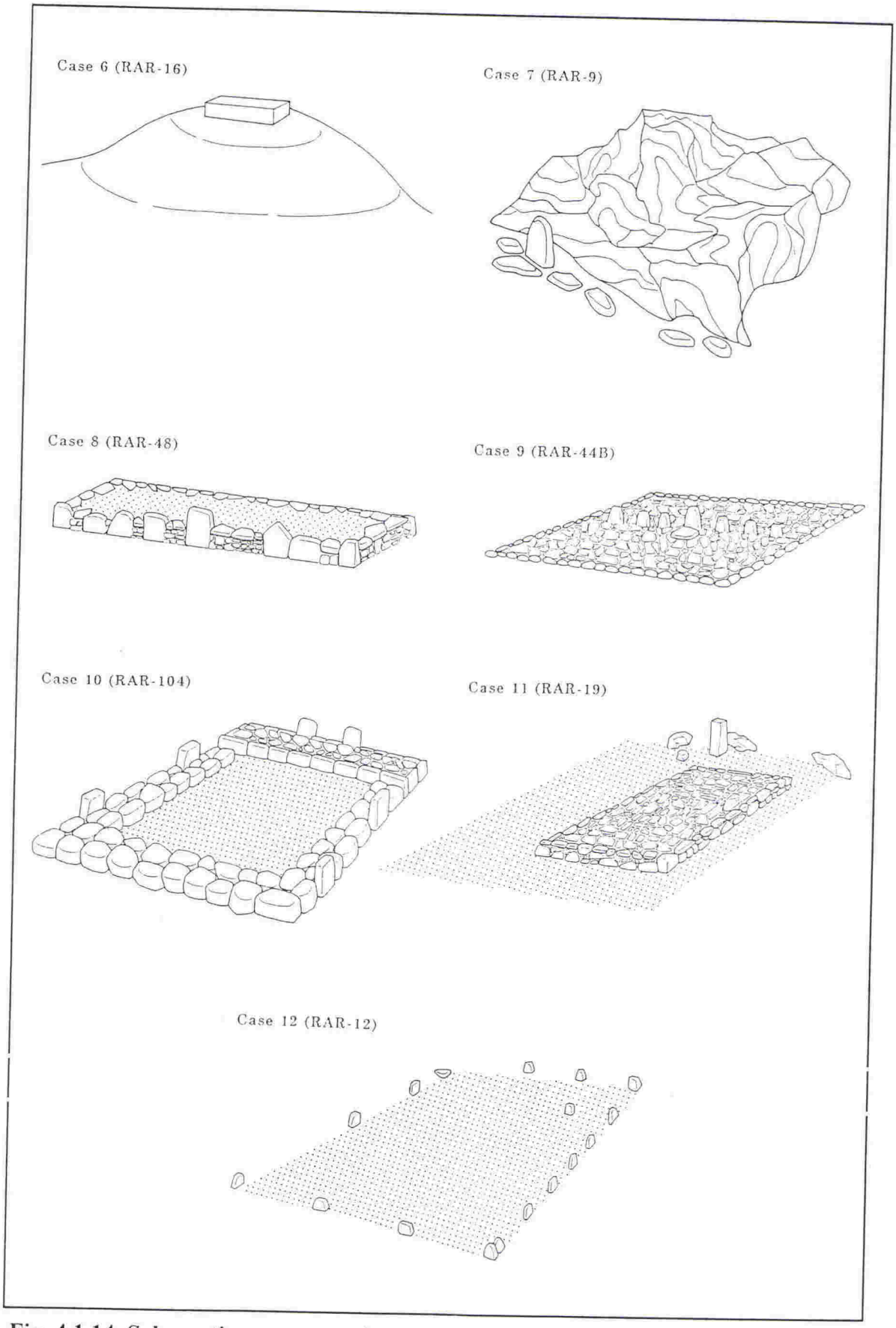

Fig. 4.1.14. Schematic reconstruction of *marae* located on floodplains

ceremony lies at the upper side and looks higher and larger from the court than it actually is. Such a visual effect would be expected in Case 1 as well. It is not, however, adequate to establish either as a morphological type of 'mountain *marae*' or 'inland *marae*'. There is another case — also lying in a mountainous topography — which exhibits different configuration (Fig. 4.1.13):

Case 5 (RAR-105). This *marae* is located on a narrow ridge which slopes down to Turangi Valley (see also Fig. 4.1.6). The rectangular court is not in terraces but is enclosed with curbstones, and covered with coral gravel. Several uprights are set on edge along the upside of slope. An upright, which is one of coral slabs, also stands at the center of court, and a small rectangular enclosure is ancillary to the upright. Two tiny uprights, between which there is an open space, stand at the downside of this enclosure. The excavation revealed that a pit oven (umu) existed within the enclosed space. These central elements would have served as a focal point within the confines of court.

Marae existing on floodplains demonstrate more morphological variations both in their elements and in their collective configurations. The most unusual *marae* would be five sites associated with mounds or heaps. I describe below two representative cases (see also Fig. 4.1.14):

Case 6 (RAR-16). This site is one of *marae* associated with a mound which is probably a residual hill of Pleistocene terrace (see also Fig. 4.1.4). A platform of basaltic breccias is situated on the mound. There is no trace of defined courtyard, but the open space of floodplain lying north of the mound would have worked as the court where the people gathered;

Case 7 (RAR-9). This site is not associated with a mound or heap, but with a residual part of *makatea* (the raised coral flat) rock which survived marine erosion (see also Fig. 4.1.5). The *makatea* rock, however, would have been the focal point of ceremony which is analogous to the mound of Case 6. While this *marae* lacks any trace of a defined courtyard in the same way of Case 6, it is not provided with an artificial platform on the rock. A basaltic upright currently stands in front of this rock, although it is unclear whether the upright is an original element of *marae*.

Three other *marae* (RAR-20, 26 and 35) are associated with heaps of coral or basaltic boulders. While these heaps are not of *makatea* rock, they exhibit amorphous elevations similar to the *makatea* rock in Case 7. It is likely that all of them are related to the concept of a focal point in ceremonial activities, since the heaps are the most striking elements with the landscape where these sites are situated. No ceremonial site in other East Polynesian islands known to me contains such an element. It is apparent at least that these mounds or heaps are quite distinct from *marae* of the so-called "basic types" which have been reported from the Society Islands and the Tuamotu Islands [5].

Another case having no trace of defined courtyard is delineated below and shown in Fig. 4.1.14:

Case 8 (RAR-48) This *marae* consists of a large rectangular platform without any sign of a defined court. The platform is formed with orthostats over 1 m high. Bellwood (1978:81) points out that the technique of construction is fairly common in the *marae* of the Leeward Society Islands. In this example, the structure lies on the floodplain of Turangi Stream, and the platform faces to the stream. While it has no enclosure, the open flat space in front of the platform probably served as the courtyard. These characteristics are held in common between Case 6 and Case 8. The latter, however, has no mound or heap, and this point makes two cases discrete.

Several *marae* having a defined rectangular court are found on floodplains as well as in Maungaroa Valley (see also Fig. 4.1.14):

Case 9 (RAR-44B). Site RAR-44, reported by Trotter (1974: 82), is located on the inland side of *Ara Metua* within the southeastern part of Rarotonga. It has some uprights, curbstone lines and a pavement. While the entire plan is unclear, it looks like the paved platform of a T-shaped *paepae*. More than 60 m oceanward from this structure another architectural feature was found in 1996 and registered as RAR-44B. It consists of a rectangular pavement of basaltic cobble, which is 6 m by 4 m in size. The court has some resemblance to that of Case 2 in Maungaroa Valley. It does not, however, have the platform but a row of seven basaltic uprights strung out along the center of pavement. The collective configuration of Case 9 would be unique in Eastern Polynesia,

but there is a high likelihood that it was reconstructed or reformed after the expedition of Canterbury Museum. Unfortunately, we did not have enough time to collect the oral information of its present construction;

Case 10 (RAR-104). This *marae* consists of a small rectangular court enclosed by a double line of basaltic cobble and a paved platform lying at the north end of court. The court is not paved but covered with basaltic gravel. Several uprights stand behind the platform and along both sides. Bellwood (1978:86) points out its considerable similarity to a *marae* in Rangiroa, Tuamotu Islands;

Case 11 (RAR-19). It is one of those sites called *koutu*, which were associated with various activities or functions: burial grounds of *ariki* families, where *ariki* resided with their households or where tribal discussions took place and where tribal annual feasts of first-fruits were performed (Savage 1962: 119). The essential activities were, however, investiture ceremonies of *ariki* (Duff 1974a: 28). Site RAR-19 includes an architectural feature which is said to have been associated with these activities (Duff: 1974a:30). The structure consists of a rectangular court which is not curbed but covered with coral gravel, a rectangular platform at one end, and a large basaltic upright. While the collective configuration is unique, the architectural elements are similar to those of Case 10 [6];

Case 12 (RAR-12). This *marae*, which is on Motu Tapu, consists of a rectangular court of 12 m by 10 m in size, which has no trace of curbstone lines but is edged with basaltic uprights standing along its borders (see also Fig. 4.1.10). The court is covered with coral gravel and cobbles, but it is not evident whether this element was artificial, since such gravel and cobbles are scattered outside the court as well. This *marae* has no platform, but one basaltic upright stands within the court, which would be a part of the row of uprights exhibiting ceremonial focal point.

The sites enumerated above document the wide variety of configurations that occur, despite the fact that these sites form just a part of the total number of Rarotongan *marae*. The diversity does not, however, comprise a disordered set, since all cases include at least two basic concepts: the 'sacred area' and the 'focal point of ceremonies' (cf. Bellwood 1978: 87). This means that all twelve cases can be put in order within a classification (Fig. 4.1.15). This is accomplished first by training attention on the courtyards

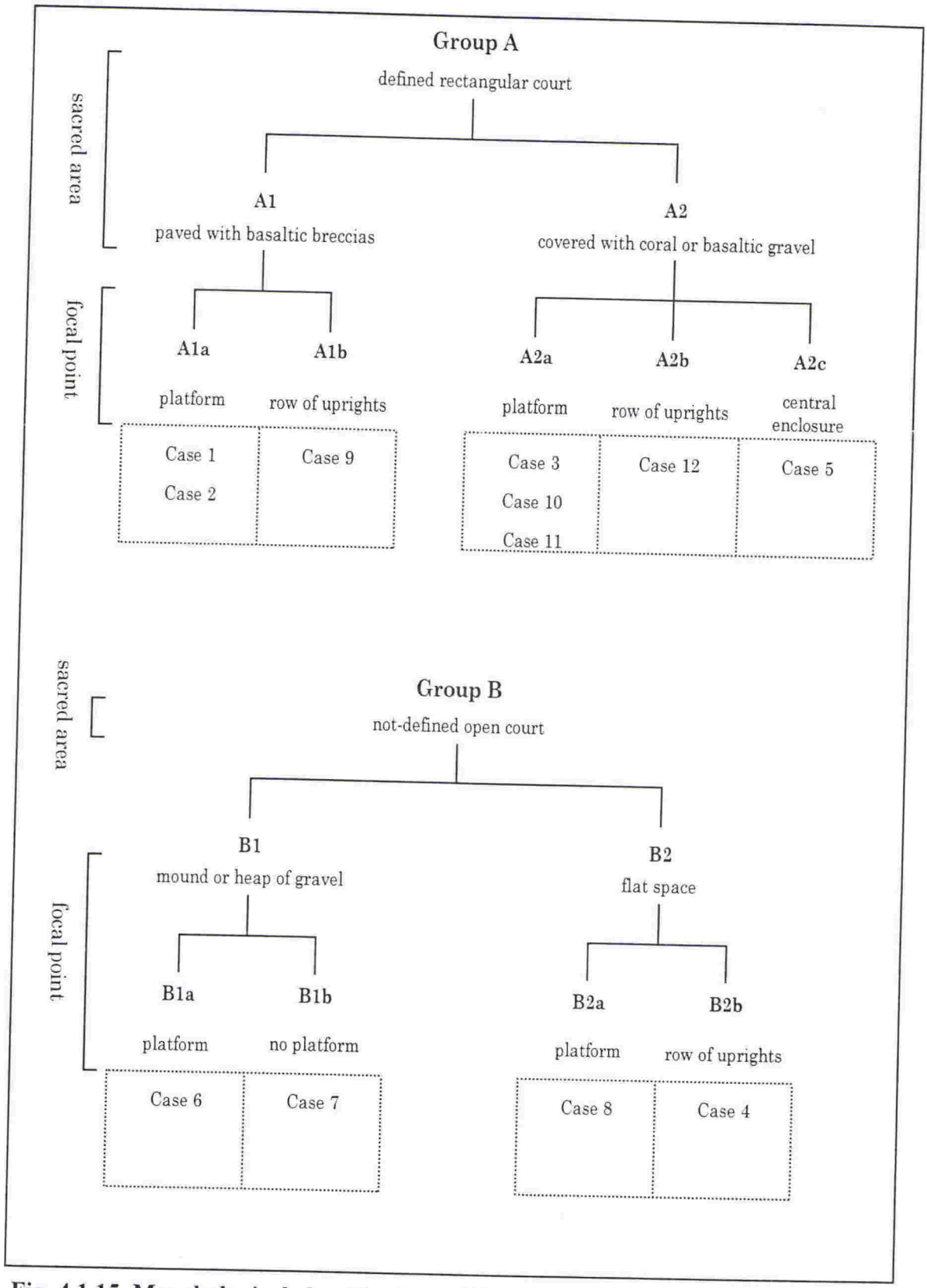

Fig. 4.1.15. Morphological classification of Rarotongan *marae*

Although Rarotongan *marae* show a wide variety of configurations, it is not without structure. Thus, they can be classified according to characteristics of basic concepts: sacred area and focal point of ceremonies.

representing sacred areas. Here one can divide the twelve cases into two basic groups: Group A of those *marae* having a defined rectangular court and Group B of those having an open court which is not defined. Group A splits again into two sub-groups according to the form of courts: Group A1 having the paved court and Group A2 having the graveled court. Group B also splits into two sub-groups according to characteristics of focal points: Group B1 having the mound or heap and Group B2 having the focal point on flat space. In addition, we can subdivide all sub-groups on the basis of the form of their focal points.

It seems somewhat difficult to decide at which level in Fig. 4.1.15 it is best to establish 'types'. At the lowest level each group contains a few of *marae*, and there is thus the likelihood that they are just variations within upper level groupings. What is more important, perhaps, is that the Rarotongan people constructed a wide variety of *marae* by employing permutations of its elements which — while these are to be associated with the basic concepts — allowed the marked variations. In short, the variation can not be ascribed simply to topographical circumstances such as a mountainous interior or lying on a floodplain. For instance, *marae* of Group A2a and the paved courts of Group A1 are observed in both topographic conditions.

4.1.8. Heterogeneity among Rarotongan *Marae*

The degree of a morphological variety discussed in the previous section is, moreover, encountered within the confines of a single river basin such as that of Turangi (Case 5, 10 and 7) or Avana Valley (Case 6, 8 and 12) as well as that of the upper Maungaroa Valley. This means we must also think that a *marae*'s location exhibits the same tendency, as such conformity would not be coincidental. Each *marae* should be an architectural feature exhibiting the importance of its locale when serving as a ceremonial space. The landscape of ceremonial space was "a construct of human beings ··· through human ascription to it of mythological creation" (Ucko 1994: xviii), and the

construction of *marae* was a physical action related to such an ascription. If so, the configuration of *marae* itself should form part of the local landscape. It is therefore likely that the diversity of configurations was at least partially associated with that of their more specific locations.

Following this line of reasoning, we can probably elucidate several characteristics of *marae* localities. For instance, Case 2 (RAR-51/15) situated on a narrow flat space of Maungaroa Valley has a platform facing to the valley side. This orientation of the Case 2 is diametrically opposed to that of a terraced *marae* of Case 1 (RAR-51/1) located in the same slope. Each case would point to a different object: the former with an orientation to a peak (Mt. Tongaiti) on the opposite side of valley and the latter to a peak (Mt. Raemaru) lying upward the slope [7]. In addition, such a locality with specific difference affects the collective configuration of each *marae*.

The Case 5 (RAR-105) — situated in the interior of Turangi Valley — also provides other instance. The uprights strung out along the narrow ridge diverge from one another. They are interspersed as if the person sitting at each position could view the massive figure of Mt. Piako (see Fig. 4.1.6 and 4.1.7). Moreover, the coral uprights standing within the *marae* court would be an element appending the mental landscape focussed on the ocean to this overall mountain situation, while basaltic uprights in Case 12 (RAR-12 *marae* on Motu Tapu) would be elements to the contrary.

The heterogeneity of Rarotongan *marae* therefore must be interpreted within the diversity of ceremonial landscapes occurring within each territory of major *tapere*, rather than directly associated solely with their place in stratified political system. In my opinion, T-shaped *paepae*, *'are kariei*, *koutu* and some *marae* distributed along the *Ara Metua* were indeed associated with political meanings, but most *marae* would have been constructed in addition with respect to more cosmological or mythological meanings which are related to their various topographic features.

While any difference in construction periods must be considered as well as one of the factors causing such a variety of *marae* both in location and morphology, currently we lack sufficient radiocarbon dates to elucidate the detailed chronological sequences for *marae* development (see Table 4.1.1). If it is entertained that the people still retained memories of many of their ceremonial sites, including heavily disturbed ones, at the time of the Canterbury Museum Expedition in 1960's, however, it seems plausible that at least most of them were still in use at the time of European Contact. The heterogeneity of Rarotongan *marae* that is demonstrated in both their location and morphology therefore must be interpreted as reflecting the richness and complexity of ceremonial or cosmological meanings in late prehistoric period.

4.2. Ceremonial Structures in Mangaia, the Southern Cook Islands

Mangaia is the most southerly of the Cook Islands. The island divides into two broad geological units: the inland volcanic area of highly weathered basalt, and a seaward ring of elevated limestone reefs called the *makatea*. The last is between 1 and 2 km wide, with surface elevation of 10 to 60 m (Fig. 4.2.1). The inland area is incised by valleys forming in a radial drainage pattern out from the central volcanic cone. These valleys are filled with fertile alluvial deposits, on which the main irrigation systems have been constructed to cultivate wet taro. The island is "divisible into six radial territories, on the basis of its stream valley topography, and this natural division provided the basis for indigenous political segmentation" (Kirch 1994: 272-3). Within the territory of each 'valley-polity' (Kirch 1994: 273) or tribe (*kopu*) (Buck 1934: 102), the streams continually irrigate the vast taro fields and then drain off into a series of picturesque lakes, overhung on the seaward side with lofty crags of the *makatea* (Gill 1876: 35).

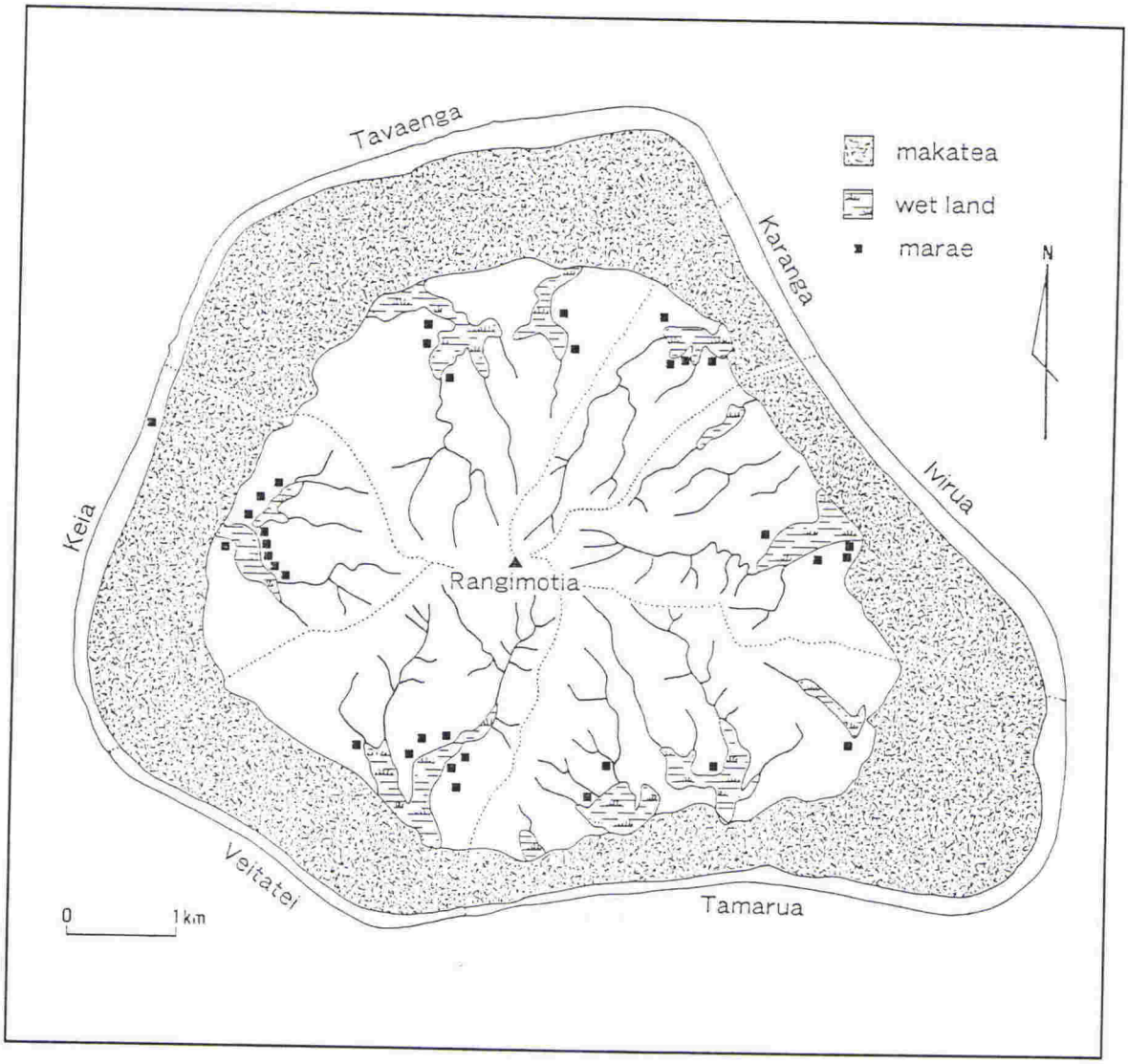

Fig. 4.2.1. Distribution of *marae* in Mangaia

Thirty-three *marae* are plotted in this figure on the basis of Bellwood (1978) and Chikamori (1990). MAN-30 *marae* is not shown, since its location is unclear. Of interest is that most *marae* are distributed around irrigated taro-fields. The solid lines exhibit boundaries of valley polities or territories of tribes (*kopu*).

Mangaian ceremonial structures have been surveyed by Bellwood (1978) and Chikamori (1990). They have reported and plotted thirty-two *marae* on their maps [8]. Their descriptions indicate that the Mangaian *marae* exhibit a pattern contrasting with that of Rarotonga in respect of their locations and collective configurations. This is conducive to their analysis in respect of the localization of ceremonial architecture.

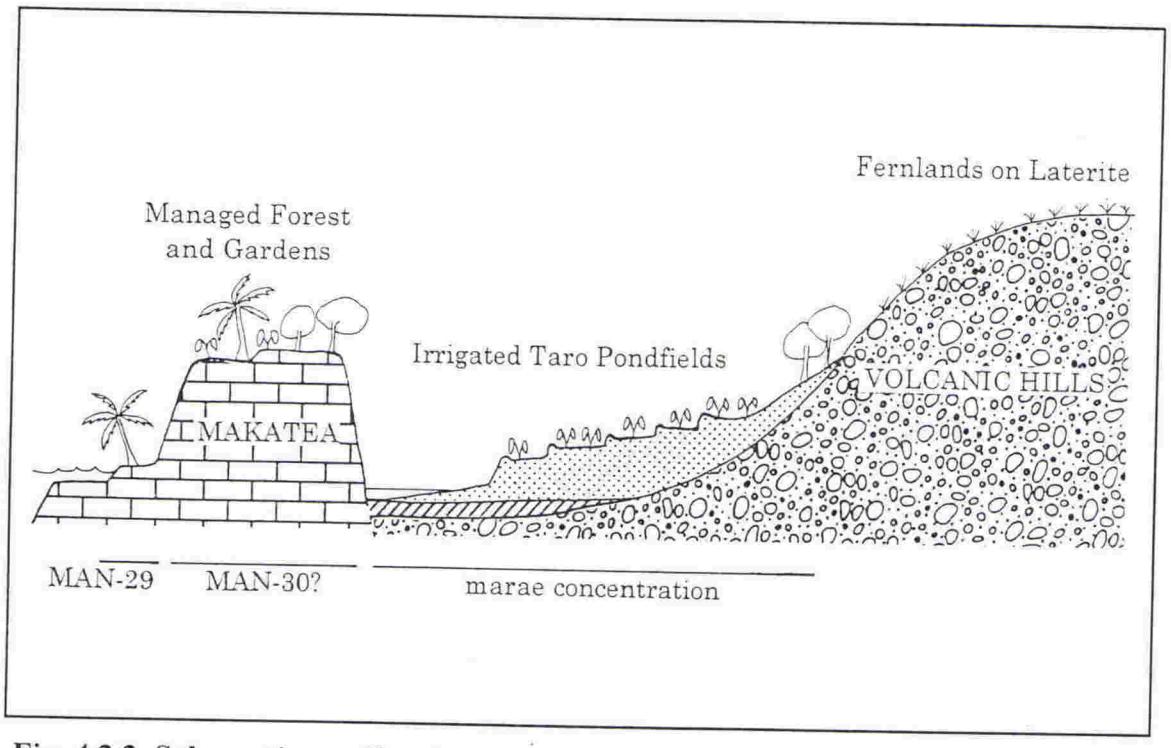

Fig. 4.2.2. Schematic profile of topography from the coastal area to the inland
Modified after a Kirch's figure (1994: Fig. 109). It shows that most Mangaian *marae* are distributed on the vicinity of irrigated taro-fields, with a few exceptions.

4.2.1. Location of Mangaian *Marae*

Most Mangaian *marae* are distributed in the vicinity of irrigated taro fields situated on the alluvial lowlands. The exception is site MAN-29, which is unique in its coastal location against the seaward cliff of the *makatea* (Fig. 4.2.1). The inland *marae* occur on flat ridges or terraces artificially cut into slopes near the taro fields. While the location of each site or its landscape is not necessarily adequately recorded, several *marae* are seemingly adjacent to the edges of taro patches. This distribution pattern demonstrates the deliberate association of *marae* with irrigated fields (e.g. MAN-1, 4, 10, 17, 18, 27 and 34 *marae*, on the basis of Bellwood's descriptions).

The irrigation system is even now a marked element of the Mangaian cultural landscape. It would also have been a valuable and meaningful feature in the prehistoric society. Mangaia, however, displays a range of

topographic features, whose distribution is concentric (Fig. 4.2.2): a fringing reef or narrow lagoon varying in width from 50 to 200 m, a rugged coastline rising to a gently sloping bench 60 to 300 m wide, *makatea*, alluvial plains with lakes and swamps (and irrigated taro fields), undulating to rolling hills with flat to gently sloping valley floors, and the moderately dissected central volcanic cone (Webb 1981: 10). The territory of every valley polity — the wedge shaped land block running inland from the coast — contains all of these major topographic features in its ideal form. Some of them — in particular the coastal bench and *makatea* — produce striking views which seem to make them eligible for *marae* construction in away similar to that on Rarotonga.

In support of this, a distinction between the ocean (*tai*) and the land or agricultural fields (*uta*) is found to essential in the religious realm (Shibata 1990: 223). Each element was worshipped by the main spiritual rulers or priests, as either a class of *ariki pa tai* or *ariki pa uta* (Reilly 1993: 72). In addition, the 'Tradition of the Deluge in Mangaia' contains several motifs of such topographic features. The story starts 'the desperate strife' between the furious sea caused by Raka (the god of winds) and the heavy rain caused by Aokeu (the lord of rain), and continues along the following lines:

> At the outset, Rangi, the first sovereign of Mangaia, had been warned of the desperate strife of elements about to take place; and, with his few people, awaited at [Mt.] Rangimotia the issue of the contest. It was with great concern that he saw, on the one hand, the wild ocean covering the belt of rocks which surrounds the island, and, on the other hand, a vast lake of fresh water rising rapidly, and tumultuously rushing to meet the advancing ocean. ··· Rangi resolved to appeal to Great Rongo to save him and his beloved 'Auau' (Mangaia) from destruction. To reach his *marae*, ··· it was needful for the brave Rangi to make his way through the waters ··· along a ridge of hills to a point named Teunu, lying due east. Just here is a spot called "the standing-place of Rongo," ··· and he shouted, "A tira !" (it is enough). ··· The ocean sullenly returned to its former level, and the rain ceased; after a while the waters of the interior were drained off, and the present agreeable diversity of hill and vale was eventually presented. Hence the proud name of the supreme god of Mangaia, Rongo arai kea, i.e., "Rongo, the warder-off of mad billows." ··· Aokeu, lord of rain, was acknowledged victor; for after the wild rage of ocean had expended itself upon the rocky heights near the sea, the cliffs

[called makatea] remained essentially the same. [Gill 1876: 81-2 (underline mine)]

Various topographic features are stated in this story. The cliffs of *makatea* play an essential role at the forefront of the strife. There is also the setback of the furious ocean. The tradition illustrates that the Mangaian cognitive space involves a variety of topographic features. The archaeological evidence, nevertheless, indicates that most *marae* are distributed around taro fields. Yes, the *marae* of MAN-29 lies on a western coastal bench, and one *marae* is said to have existed on the top of *makatea* just above site MAN-29 (Bellwood 1978: 161). However, such locales are not common, but quite unusual in location of Mangaian *marae*. Thus, it is tempting to interpret the vicinities of irrigated taro fields as provided those special conditions deemed desirable as places of *marae* construction. One of the factors would be the condition that these locales were those related to various ceremonial, agricultural and political activities, as discussed below.

4.2.2. Subsistence Production and Ceremonial Activity

The prehistoric predominance of wet taro in subsistence would be strongly supported by the modern agriculture and food consumption which Allen (1971: 375) documented when he surveyed the situation in 1967. The wet taro fields occupied more than 85 % of the cultivated land, and cooked pieces of wet taro from these fields formed approximately the half of the sample meals. While the irrigated taro fields made up only 2 % of the total land area, these were the single most productive and valued crop in the island (Kirch 1994: 272). This would have been the case as well as in prehistoric Mangaian society.

It is easily conceivable that the cultural landscape of wet taro fields and its substantial role in the subsistence production was also essential in the ceremonial domain. The association of ceremonial activities with wet taro is supported by an ethnographic account of a daily offering of it at the national

god house called as Te Kaiara (The prop-of-the-kingdom) in which statues of principal gods in the island were held (Gill 1876: 95). It states that:

> [the keeper of this god house] just before sunset cooked (or rather half-cooked) an oven of taro for the use of the gods! The first half-raw taro was thrown into the bush with these words, "Rongo, here is thy food, eat." Next came, "Motoro here is thy food, eat." After going through the whole thirteen, the keeper threw in the deepening gloom a single taro, saying, "All ye little divinities, ··· here is your food, eat." [Gill 1876: 99]

Not only major gods such as Rongo and Motoro, but also inferior tribal gods, were served with taro as their offerings. The wet taro was essential to ceremonial activities, and the people would have performed such ceremonies to supplicate the fertility of wet taro.

4.2.3. The Relationship of *Marae* Location and Water Supply to the Irrigation Systems

The site-distribution within Keia District — one of traditional valley polities — well demonstrates the spatial association of *marae* with irrigation systems (Fig. 4.2.3). This district contains two irrigated taro-swamps extending up into the gently sloping valleys. In the southern larger swamp two systems of irrigated wet-fields are distinguishable. One of them is the system in the upper valley, which consists of single flights of terraces lying parallel to the stream, and another is the system of the middle valley which consists of seven terraces on which a number of levee or bound outlined plots line up across the valley floor (cf. Allen 1971: 372). The water supply of middle valley is more delicate than that of upper valley, as it is maintained solely by a channel leading water into the top terrace of the series. The water of Tareao Stream is led into an artificial channel running down along the north side of valley. The channel has seven water intakes in places, and they deliver the proper amount of water into each level of terraces in the middle valley. Every plot is then supplied with sufficient water for wet taro to grow.

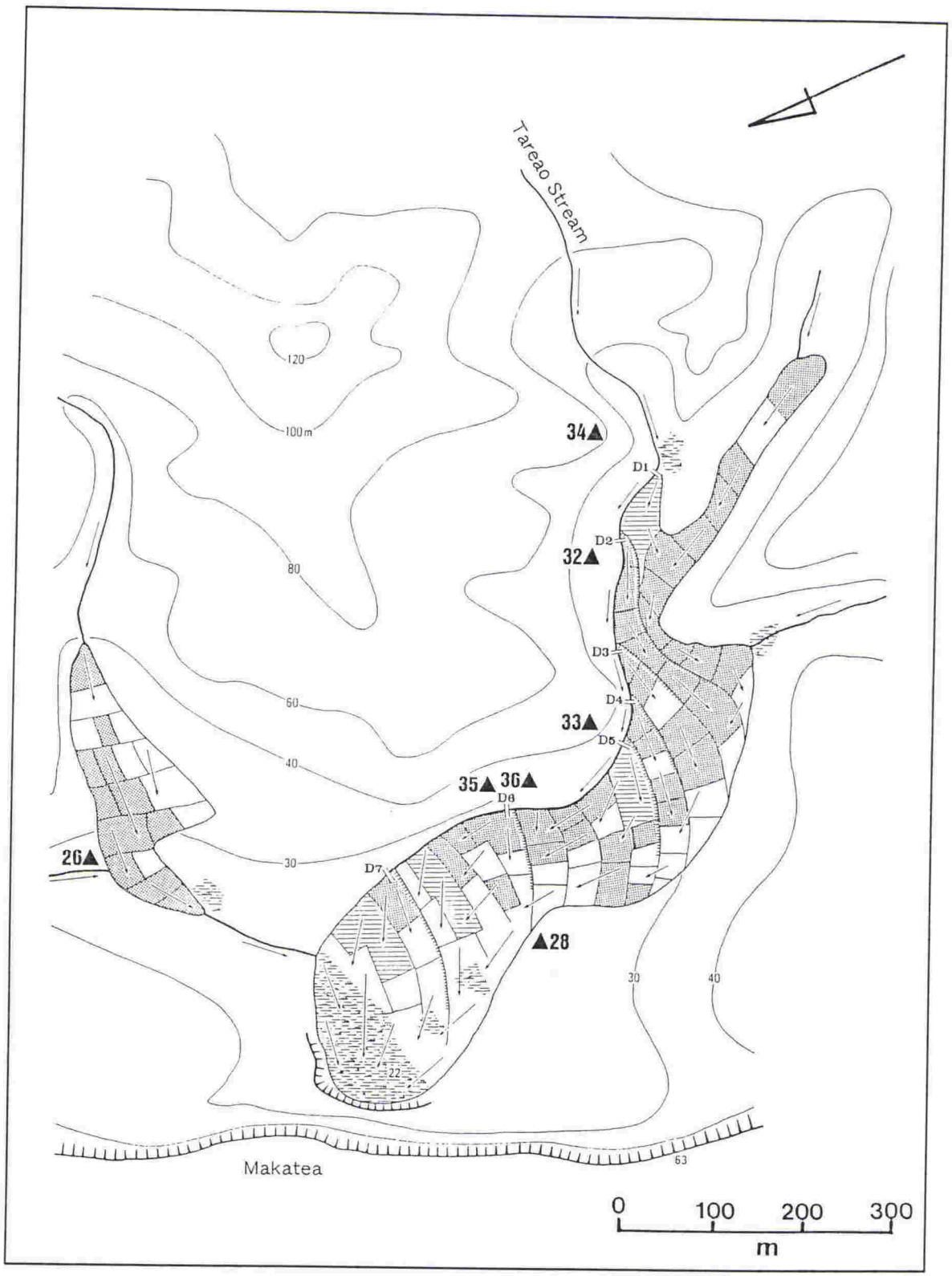

Fig. 4.2.3. Spatial distribution of *marae* and irrigated terraces in Keia District

Taken from a Chikamori's figure (1990: Fig. 2). Ten *marae* have been reported in Keia District, the western part of Mangaia. One of these is MAN-29, which lies on the coast and thus is not included in this diagram. MAN-25 and 27 were also not plotted in the original figure. This diagram therefore contains the remaining seven *marae* (shown by ▲). Six of them display their apparent association with the water supply and irrigated terraces.

Ten *marae* are found in this district. One of them, site MAN-29, lies on the coast and is outside the area covered by Fig. 4.2.2. The rest of the *marae* are situated in close proximity to the taro swamps. Since the precise locales are some unclear in the Chikamori's original diagram (1990: Fig. 2), two of them (MAN-25 and 27) are not plotted in Fig. 4.2.2. Five *marae* are strung out along the channel emanating from Tareao Stream and located just above one of the water intakes. Site MAN-26 — which a Bellwood's informant interpreted as *'are karioi* — also exists at the junction of a stream there associated with the smaller northern taro swamp. Chronological relations of *marae* to water intakes are currently unknown, but the pattern of locations common to the above six sites illustrates an association of *marae* with the water supply irrigation system.

4.2.4. Political Control of Irrigation Systems

Channels and water intakes are essential elements contributing to the control of water within irrigation systems. It is thus likely that these elements were maintained by reciprocal and obligatory relationships formed at the level of high-order social entities, although each plot including the levees and the spillway to the next plot were kept in good order by each cultivator (Allen 1971: 376-7).

Ethnographic accounts note that in late prehistory, up until the advent of missionaries in 1823, political history was dominated by incidents concerning the succession of *mangaia* (Reilly 1993). The title or position of *mangaia* — the supreme temporal authority in the island — was usually attained through intertribal wars, "for which the primary impetus was control of the valuable irrigated taro fields" (Kirch 1994: 276). After each of these wars the conquered groups lost their holdings in 'the rich taro lands', although they were still given shares in the terraces forming upper narrow ends of the valleys (Buck 1934: 111). The rich taro fields — evidently agricultural fields in middle valleys — were awarded by the new *mangaia* to his own

subordinate chiefs called *kairanga-nuku* (literally meaning 'land eating') who controlled "the distribution of the taro lands within the subdistrict" (Buck 1934: 118). The inference derived from these descriptions is that the social relationships necessary to maintain channels and intakes of the irrigation systems in the middle valleys would be focussed on the level of subdistrict social groupings and retained by political authorities assigned to subordinate chiefs.

4.2.5. Ceremonial Legitimization of Political Authorities

The Mangaian political system in discussion of *mangaia* installations has been linked to related ceremonial activities (e.g. Buck 1934: 118; Reilly 1993: 71-2; Kirch 1994: 277). The title holders of *mangaia* were not necessarily related to sacred descent lines but were instead seen as secular rulers. They could, however, procure *mana* through ceremonies of human sacrifice offered to the god of Rongo. Such ceremonies were controlled by the collective *ariki* who were the main spiritual rulers (Reilly 1993: 72). Again, the temporal authority of *mangaia* usually needed to be legitimated by relevant ceremonies. It is likely that this pattern was also the case with subordinate chiefs. They would not necessarily have been as closely related to sacredness, since they were temporal rulers selected by their supreme ruler holding the title of *mangaia*. We can therefore infer that subordinate chiefs also would have needed to be ceremonially legitimated in order to exercise the authority to distribute wet taro fields and control the water supply in their own sub-districts.

4.2.6. *Marae* as Focal Points Uniting Various Activities

In the above sections, I discussed the linkage among three aspects of Mangaian society: the wet taro cultivation as a main means of subsistence production, the prevailing political system within that society, and the

ceremonial activities related to these two other domains. The most productive and valued irrigation systems often precipitated intertribal conflicts under increased pressures probably resulting from population increase (Kirch 1994: 287) and anthropogenic degradation of interior forests (Kirch et al. 1992). The control of irrigated fields — including the water supply to them — belonged to the secular chiefs. In such a manner, the political system was entwined with irrigation systems.

The cultivation of wet taro, as noted above, was related to gods through ceremonial activities of offerings which were performed to supplicate the fertility of wet taro. The secular chiefs of political system offered human sacrifices to the god of Rongo in order to legitimize their authority. It may even be appropriate to see the relation between secular chiefs and Rongo as ideologically symmetrical to the ceremonial link between wet taro and divinities, along the lines represented in a schematic figure provided by Kirch (1994: Fig. 107).

In any case, ceremonial activities link both aspects of the subsistence production and the political system to Mangaian spiritual worlds. Such a linkage opens us to the interpretation that *marae* were focal points uniting various activities related to the above three aspects, and that this tripodal linkage was intentionally displayed in physical form by the construction of *marae* at locales which are adjacent to irrigated terraces. While there is the possibility that varying degrees of sacredness were imposed on other topographic features, the vicinity of irrigated terraces would be the most suitable locales for building *marae*, since *marae* were focal points of agricultural and political as well as ceremonial activities. Moreover, the irrigated terraces were the essential productive components within a cultural landscape which exhibited a close association with all three of the above three aspects.

4.2.7. Morphological Features of Mangaian *Marae*

More than the half of thirty-two *marae* are heavily disturbed at present, but their morphological features can be reconstructed by an examination of twelve more complete *marae* which Bellwood (1978) and Chikamori (1990) reported (Table 4.2.1). Basic architectural elements — archaeologically observed in all or most cases — are the enclosed rectangular court and coral or stalactite uprights. Most courts are raised or terraced, and a few are covered with coral gravel or paved with coral slabs. In addition, several *marae* have a platform or a stone arrangement within their courts.

On the basis of his investigation of the courts, Chikamori (1990: 58) proposed three 'types' of Mangaian *marae*:

Type 1 (Raised court). The court is faced with coral slabs on all sides and filled with soil to form a rectangular platform. For instance, MAN-15 and 22 are classified as examples belonging to this type;

Type 2 (Terraced court). The court — built on slope — is faced with coral slabs on three sides (but not the upper side) and filled with soil to form terrace. The examples of MAN-25 and 26 come into this type;

Type 3 (Paved court). The court is faced with coral slabs on all sides, and then filled with soil to form a rectangular platform that is paved with coral slabs. This type is presented by only one *marae*, MAN-29.

As appropriately addressed in his *marae* descriptions, however, the above types — or first two at least — are associated with certain topographies. Therefore, while most *marae* are commonly close to irrigated taro fields, topographies of their actual locales generally come in two patterns: flat and open spaces on ridges and slopes. Type 1 *marae* which have the raised court tend to be on flat spaces [9], and Type 2 *marae* exclusively lie on slopes leading down to the irrigated taro fields. Accordingly, the difference between two types mainly reflects the variance between these two topographic patterns.

Table 4.2.1. Topographic and Morphological features of Mangaian *Marae*[1]

MAN-	districts	related gods	ref.[2]	topographic features related to location	court					inner component		uprights				dimension (m)[3]
					enclosed with coral slabs	raised	terraced	covered with coral gravel	paved with coral slabs	platform	stone arrangement	corners	sides	inside of court	outside of court	
6	Veitatei	Te-aio, Tane	B: Fig. 70	ridge	X	X							X			20 × 11
7	Tamarua	Tane-kio	B: Fig. 71a	steep slope	X		X	X				X	X		X	16 × 8
10	Tamarua	Turanga	C: Fig. 3	gentle slope	X		X?									20 × 6
12	Karanga	Motoro	B: Fig. 71c	gentle slope	X		X					X				30 × 11
15	Ivirua	Tane-ngaki-au	B: Fig. 72a; C: Fig. 4	ridge	X	X					X	X				22 × 16
16	Ivirua	Tane-ngaki-au	B: Fig. 73a	flat space at the base of scarp	X	X						X				35 × 11
17	Ivirua	Rongo	B: Fig. 72b	gentle slope at the base of makatea	X		X			X		X	X	X		19 × 10
22	Tavaenga	Te-aio	C: Fig. 5	ridge	X	X										27 × 13
25	Keia	unknown	B: Fig. 75; C: Fig. 6	steep slope	X		X	X		X		X		X		22 × 10
28	Keia	unknown	B: Fig. 77a; C: Fig. 8	flat space at the base of scarp	X							X	X			15 × 9
29	Keia	Rong	B: Fig. 77b	flat space on beach	X	X			X	X						7 × 10
32	Keia	Rongo	C: Fig. 9	gentle slope	X?			X				X	X			? × ?

(1) This list does not include sites identified as dwellings (MAN-11 and 18) and *'are karioi* (MAN-26).

(2) Data were collected from diagrams both in Bellwood's and Chikamori's reports ("B": Bellwood 1978; "C": Chikamori 1990). Some of Bellwood's data were in disagreement with Chikamori's. In such a case, I adopted the latter's information.

(3) The main axis of most *marae* — as expected from the position of its focal point (platform or uprights) — is shorter than a second axis at right angles to the main one. However, the main axis of MAN-29 *marae* is longer than the second, and its length-width values are thus treated conversely in this table and Fig. 4.2.4.

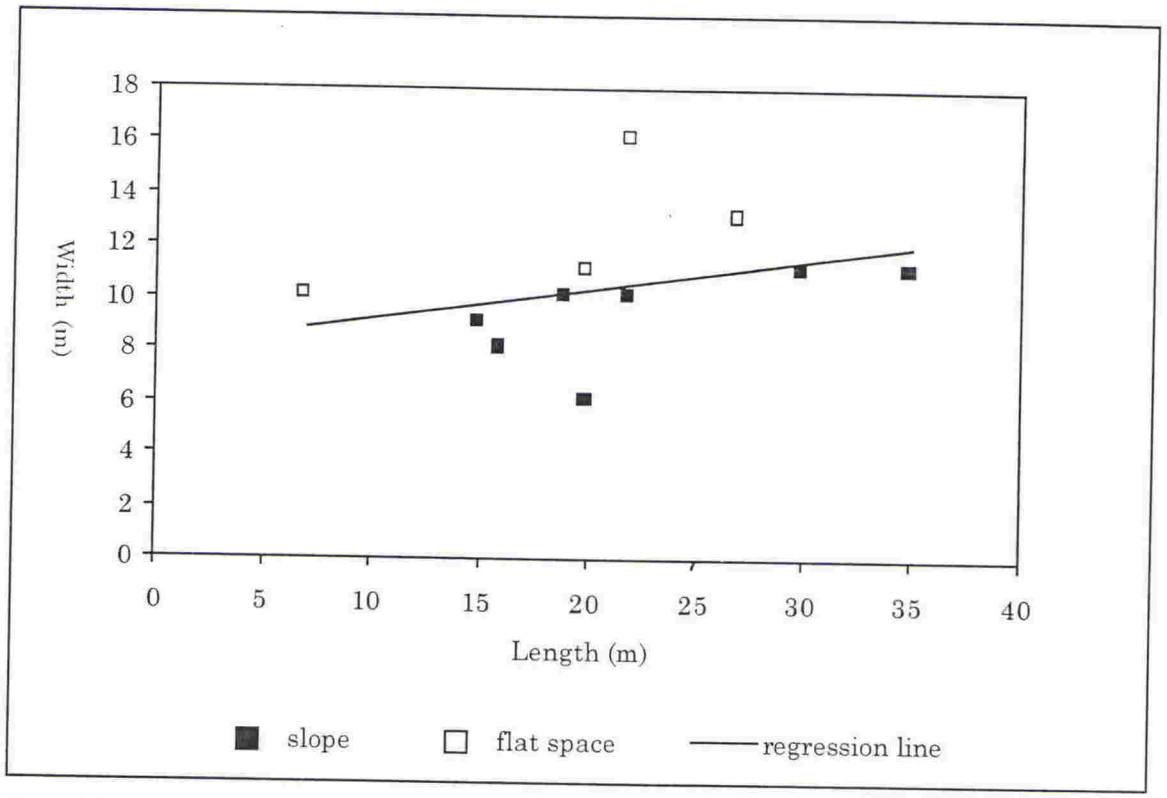

Fig. 4.2.4. Proportion of Mangaian *Marae*

Except MAN-33 (whose court boundary is unclear) eleven measured *marae* fall into two groups on the basis of the proportion between length and width. These variations are also associated with the topographic patterns of their location.

In the one case of the Type 3 *marae* which has the paved court, it may be viewed as a variation of Type 1, since it is both raised and lies on a flat space associated with coastal zone. Every type is based on a same technology of a soil fill within an enclosed court to form a structure exhibiting a foundation platform higher than the surrounding ground (see Bellwood 1978: Fig. 78). It can be said therefore that the differences in type are simply caused by the inclination of original ground surface where the *marae* of each type occur.

Another type of variation is observed in shape of the *marae* courts. While the proportion between length and width of courts varies individually, they generally fall into two groups. One group of *marae*, plotted below the regression line in Fig. 4.2.4, are those having the narrow rectangular court. Another group is of those *marae* distributed above the regression line which

have wider rectangular court. Each group is, moreover, associated with a different topographic pattern. *Marae* of the first group lie on sloping ground, and the those of the second group on the flat spaces of a ridge or on the beach. The variations in *marae* proportion therefore must be also ascribed to their topographic settings rather than to functional or semantic meanings.

A kind of morphological difference which is probably to be associated with a functional purpose is seen among certain architectural elements within the court. Although most *marae* do not have any interior components, three *marae* are provided with a platform within the court: MAN-17, 25 and 29. Of interest is the fact that two of these sites are dedicated to the god of Rongo (Table 4.2.1). In contrast, *marae* dedicated to other gods lack such a component. Rongo was the only god to which human sacrifices were offered and Buck describes a ceremony of human sacrifice to him as follows:

> After the Inland High Priest of Rongo had performed the ceremonies, he caught up the victim in a sennit scoop net with large meshes, thus figuratively catching a fish. The victim was called an *ika ka'a* (fish caught in sennit). The "fish" was carried in the net to the Orongo Marae [MAN-29] on the coast. Here it was laid on the block of limestone before the stone image of Rongo. After the appropriate incantations, the ears were cut off, divided into slices, placed on leaves, and distributed among the district and sub-district chiefs. [Buck 1934: 182 (underline mine)]

This is an indication that a platform-like structure was used to lay out bodies of human sacrifices. Site MAN-29 called Orongo Marae has a platform consisting of a large flat slab supported by two courses of coral blocks (Bellwood 1978: 159). The architectural characteristic is in keeping with Buck's description. The other two *marae* with platforms exhibit different characteristics from that of MAN-29. They are larger and consist of the raised rectangular step type filled with soil and faced with coral slabs. Although the evidence is insufficient, the relation between the three *marae* with platforms and the god of Rongo suggests the possibility that such a feature within a court had a specific function in ceremonies of human sacrifices [10].

Taken as a group, however, Mangaian *marae* consist of a fairly uniform set with more coordinate elements than those showing variations. Thus, (1) all *marae* are rectangular, (2) they are enclosed with coral slabs or blocks, (3) most courts are raised or terraced by the common technology of filling their enclosures with soil, and (4) the uprights of coral or stalactite stand around their peripheries — and especially at corners — of a large number of sites (Table 4.2.1). In addition, these common elements impose a collective homogeneity on the configuration of most Mangaian *marae*.

Bellwood notes that such homogeneity "may be reflection of relative simplicity" in comparison with ceremonial sites of Rarotonga and Aitutaki (Bellwood 1978: 161), but it is somewhat facile to think that their seeming simplicity fully explains the homogeneity of Mangaian *marae*. It would have easily been possible to create a greater variety of configurations for *marae* through various other permutations of the elements described above, if the people had so desired. In support of this, MAN-29 *marae* which is the sole case having a paved court, suggests one possibility for further diversification of the collective configuration. Nevertheless, the Mangaian people generally preferred to construct or maintain a fairly homogeneous set of *marae*. Taking into account the uniformity of their locations as well, we might better seek the reasons for lack of complexity in the local conditions related to their socio-political context.

4.2.8. Homogeneity of Mangaian *Marae* and a Highly Institutionalized Political System

In the first half of Section 4.2, I illustrated the homogeneity in the location of *marae*, especially in being associated with irrigated taro fields, and discussed this linkage with the economic and political aspects of that society. In the same way, we can also expect that the degree of morphological homogeneity is related to such aspects, in particular the highly institutionalized political system that existed in Mangaia's late prehistory.

Each of *marae* is said to have been dedicated to a specific god who Mangaians associated with their individual tribes (*kopu*) and with their particular lands. Buck (1934: 174, Table 17), for example, illustrated such a linkage among *marae*, gods and tribes. What notably demonstrated this linkage is a ceremonial custom that was performed before conflicts happened among competing tribes. The people consulted the tribal god through the priest on the methods of battle and their prospects success (Buck 1934: 158). At first sight, such a custom may appear to have enhanced the discreteness of each tribe, and might have stimulated the diversification of tribal *marae*. Tribes were, however, ideally incorporated into an island-wide political system, at least in late prehistory, contravening this tendency.

As Reilly (1993: 71-72) has usefully summarized it, a distinctive feature of Mangaian political system is its separation of the system of political domination and that of spiritual authority. The highest office with supreme political power was called *mangaia*. It was usually attained by force of arms, and hence the office was open to any *toa* or warrior class. The spiritual authority was mainly held by three *ariki* titles: the *ariki pa uta* (interior spiritual ruler), the *ariki pa tai* (seaward spiritual ruler), and *ariki i te 'ua i te tapora kai* (spiritual ruler presiding at the head of food basket). These titles were passed on through hereditary succession. The two types of authorities were ideally in a complementary relationship. The collective set of *ariki* were the principal actors in ceremonies for inaugurating the *mangaia*, and in turn, the *mangaia* could influence the selection of the *ariki*.

It is likely that even the inter-tribal conflicts — which dominate Mangaian ethnohistorical traditions — were managed within the confines of this political system. A series of forty-two battles is currently known (Buck 1934: Table 5). These battles were brought about by tribes aspiring to attain a hold on the political power of *mangaia* (the supreme temporal authority) (Reilly 1993: 73). Moreover, such inter-tribal conflicts were not conducted without order, but in conformity to given rules or procedures that are enumerated below:

(1) Declaration of war

In late prehistory after the political authority of *mangaia* was established, it became customary for tribes aspiring to power to give some form of notice or declaration of a state of war (Buck 1934: 158). This state of war was announced by threat, challenge, or offering of a propitiatory human sacrifice. At this point in Mangaian history, the propitiatory sacrifice to Rongo became essential to the party seeking office (Buck 1934: 159);

(2) Selection of battle field

The place of battle was often selected beforehand and announced by the challenging party. On such occasions it was weeded and cleared of shrubs and banana trunks to enable the opposing forces to draw up in proper formation (Buck 1934: 159);

(3) Battle formation

In battles, the people arranged themselves in rows four deep. The first row was armed with long spears, the second with clubs to defend the spearmen, the third consisted of young men with sling stones, and the fourth comprised a row of women (Williams 1838: 209);

(4) Relief of the defeated parties

Individuals on a victorious side might save a friend or relative of the opposing side from being killed without any apparent sanction being applied against them, but the defeated people were also able to flee to recognized refuges, from which they eventually could be re-integrated into the wider community (Reilly 1993: 74);

(5) Proclamation of victory

When the peace drum sounded and the fugitives emerged from their refuges, the victors gave them a feast (*taperu kai*) in public recognition of their safety (Buck 1934: 111);

(6) Human sacrifice to Rongo

Through the early part of continuity in the Ngariki tribe's period of supremacy, the offering of a human victim to Rongo after a victory in battle became a national custom. This established Rongo as the national god of war (Buck 1934: 162). The body of victim was carried to the Akaoro Marae (MAN-32) where it remained on scaffold of pandanus wood for some time. After the 'Inland High Priest of Rongo' (*ariki pa uta*) had performed the ceremonies, he caught up the victim in a sennit scoop net with large meshes. Then,

the body was carried in the net to the Orongo Marae (MAN-29) on the coast. Following appropriate incantations the ears were chopped off, divided into slices, placed on leaves, and distributed among the district's and sub-district's chiefs. The right ear was distributed among chiefs of the right division of the island, and the left ear among chiefs of the left division. The nose was divided among two of 'High Priests of Rongo' (*ariki pa uta* and *ariki pa tai*) and 'Ruler of food' (*ariki i te 'ua i te tapora kai*), as well as the beater of the drum of peace (Buck 1934: 182).

In sum, political power was ideally procured by a set of formalized procedures involving battles and a series of ceremonies. Continuing inter-tribal conflicts resulted neither in collapse of the pre-existent political system nor in establishment of new system, but instead probably enforced the institutionalized system through the addition of supplementary procedures such as propitiatory sacrifices to Rongo.

The spiritual world was structured to correspond with that of the political system. It was characterized by the exclusive supremacy of Rongo. The distinction of Rongo from other tribal gods appears in various customs. For instance, the people believed that the only Rongo dwelled in the underworld and fed exclusively on mankind. While images of tribal gods were generally made in wood, Rongo was the only god carved in stone. The image stood on MAN-29 *marae*. In addition, Rongo was represented by a triton shell which was deposited at the entrance to "the national godhouse" called Te-kaiara (Gill 1876: 95, Buck 1934: 170, 172-3).

Integration of gods into the overall system was appropriately symbolized within "the national godhouse" situated in the Keia district. Inside it were twelve other god-images with the triton shell representing Rongo at the entrance. Of special interest is that "the office of caretaker [of the national god-house] must have been singularly undenominational [in his allegiances], for not only did he care for all gods alike, but he remained neutral during war" (Buck 1934: 172). This account indicates that the national god-house was institutionally above any special relationship to specific tribes.

These conditions, both in their political and ceremonial aspects would have prevented tribes from establishing an independent status. It is therefore plausible that the people deliberately maintained a homogeneity of tribal *marae*, both in their location and morphology, since too much diversification would have been contradictory to the overall institutional political and ceremonial system. This is also consistent with the fact that the only three *marae* associated with Rongo, viewed as the "national god of war" (Buck 1934: 162), were distinguished by the addition of special platforms.

4.3. Summary of Chapter 4 — Heterogeneity and Homogeneity —

In this chapter, the patterns obtaining among locations and morphological features of Rarotongan and Mangaian ceremonial structures are outlined, and then these patterns are linked to the socio-political conditions in late prehistory specific to each island.

In the case of Rarotongan ceremonial structures, many of them — in particular, those called T-shape *paepae*, *'are kariei* (or *'are karioi*), and *koutu* — are distributed along the *Ara Metua*, the ancient roadway traversing the basic *tapere* land divisions. Several additional architectural features, also called *marae* are, however, widely dispersed in relation to various locations spatially associated with marked topographic features, such as massive mountains, river streams, a residual hill of the Pleistocene terrace, a residual rock of raised coral flat (*makatea*), beach ridges and a coral cay. In respect of the collective configurations formed by their permutations and spatial arrangement of various elements they exhibit, T-shape *paepae* and *'are kariei* may be differentiated as morphologically discrete types. Rarotongan *marae*, in contrast, are so diverse that we can not establish a typical configuration for them.

In order to further elucidate the kind of heterogeneity imposed on Rarotongan ceremonial architecture, we need to employ two axes in the analysis related to the late prehistoric socio-political system. The first is the *Ara Metua* running parallel to the shoreline. It served as a physical line of political networking among *tapere* within each territorial tribe termed a *vaka*. Ceremonial structures distributed along this roadway can be interpreted to have played roles as political nodes within the inter-*tapere* networks. The second is the axis of the *tapere*. This axis spatially lies perpendicular to the *Ara Metua*, since *tapere* are the pie-shaped territorial divisions ranging from the mountainous inland to the ocean. While the *Ara Metua* runs along a comparatively monotonous zone of alluvial plains and terraces adjoining the seaward margin of inland hills, the territory of each major *tapere* contains a variety of topographic units and vegetation types. It is entirely plausible that the people imposed sacredness on such a variety of natural topographies within their *tapere*, and that they highlighted these sacred spaces by constructing *marae* on them.

Major *tapere* headed by *ariki* or *mata'iapo* were on the one hand included in *vaka* polities, but on the other they also enjoyed a great measure of independence in activities as far as their territories were concerned. Such independence would have promoted the leaders of *tapere* to construct their own forms of *marae* irrespective of the *vaka* polities, though they would have built T-shape *paepae*, *'are kariei* and *koutu* in order to maintain their relationship to the inter-tapere political networks. This also suggests that the socio-political units of *tapere* are essential to accommodate the morphological variety displayed by Rarotongan *marae*.

In addition, given that *marae* were one of the more important parts of sacred landscape, several morphological characteristics would be associated with topographic elements accompanied with the locations of sacred items in those landscapes. For instance, several *marae* embody natural mounds or heaps in their configurations, and other *marae* incorporate flat lands of alluvial plains as their courts. In the case of mountain *marae*, there is the

possibility that the positions of sacred peaks brought about some of the morphological variety of *marae*. In short, it can be noted that the variety in sacred landscapes must be considered as part of any interpretation of the morphological differences of *marae* observed within each *tapere* as well as among *tapere*.

Among Rarotongan ceremonial structures there are certainly groups exhibiting coordinate features in relation to their collective configurations and locations. We can not ignore, however, the considerable diversity also found among them. There is no such a site as the typical Rarotongan ceremonial structure, and the very heterogeneity is the most essential characteristic of them. This is quite contrastive to Mangaian ceremonial structures called *marae*. Mangaian *marae* are characterized by a uniformity both in their collective configuration and location.

All Mangaian *marae* — except one site existing at the western beach outside the *makatea* — lie close to irrigated taro fields. Several *marae* in Keia District are, in particular, closely adjacent to intakes supplying water to fields from artificial channels. Most *marae* also consist of common elements such as the rectangular court enclosed with coral slabs or blocks, and coral or stalactite uprights standing around the peripheries. In addition, these shared elements support the notion of a homogeneity of collective configurations. Certainly some minor variations appear in morphology and proportion of *marae* courts, but these variations seem to owe more to their topographic settings and specific locations than any functional or semantic purposes.

The association of Mangaian *marae* with the cultivation of wet taro — the most valuable resource in the prehistoric subsistence economy — is evident from the uniform pattern in their placement. This is also supported by the account that this cultivation system was linked to the spiritual world through ceremonial offerings of wet taro to gods. Similarly, the Mangaian political power, closely related to the control of taro fields, was also linked to the spiritual world by ceremonial activities such as human sacrifices to the

god of Rongo. Seen in this light, it is conceivable that *marae* were focal points of economic, political and ceremonial activities. If so, the location of *marae* in the vicinity of irrigated fields as the spatial node of linkage among these three aspects of the society would have been the most suitable places in which to construct *marae*.

The morphological homogeneity of *marae* may also be related to the political domain. The Mangaian political system in late prehistory is characterized by the separation within mutual dependence between a form of political domination (the title of *mangaia* which had the supreme power on secular affairs) and that of the spiritual authorities (three *ariki* titles which had the supreme authority in sacred affairs). Revolving around this dual system [11], various activities — including inter-tribal conflicts resulting from tribal aspiration for the title of *mangaia* — were institutionalized. Such conditions would have prevented Mangaian tribes from establishing their independence or uniqueness. It is therefore likely that the tribes deliberately maintained the homogeneity of their *marae*, since to enhance a degree of diversification would have been contradictory to the overall institutionalized political system.

I did not delve into certain more detailed contents of various meanings also encoded both in Rarotongan and Mangaian ceremonial structures. Instead, the analysis presented the examinations in this chapter has made it evident that the ceremonial architecture at least had a unique or peculiar significance which must be interpreted within the local contexts of each island's socio-political organization. Again, there are various meanings which vary island by island.

Notes to Chapter 4

(p. 147) [1] The Keio University Team carried out the second archaeological survey of this site in 1997. Prof. Tadashi Okajima, Toyoko Women's College, recovered a large pit oven at the ocean side of RAR-12 *marae*. The full description will be offered by Prof. Okajima; a brief summary is presented here. He retrieved fragments of turtle remains along with many fishbones and shells. Two charcoal samples provided dates around 1300 AD. The date corresponds approximately to the Rarotongan earliest date reported by Bellwood (1978). The strategraphic context demonstrates that the oven was coexistent with the stone arrangements. These data indicate that turtle ceremonies would have been performed here since early 14th century AD.

(p. 149) [2] Walter (1996: 89) points out the possibility that "there are the yet uninvestigated settlement areas adjacent to the irrigated systems along the valley floors." In the 1996 Keio Expedition, I had the opportunity to survey Turangi Valley along which some irrigated fields were encountered. These fields were constructed on river terraces consisting of mud flow deposits. On the opposite side of RAR-109, we found a similar river terrace which had no trace of irrigated fields. Instead, it was first expected to set aside for dwelling spaces, since stone heaps looking like *paepae* pavements were found on the terrace. But, the excavation revealed that these stone heaps were parts of mud flows. We also investigated some ridges along the valley sides, but all ridges were very much narrower than the hills of Maungaroa area, and no architectural features were discovered there. However, our observation in Turangi Valley, as such, does not deny the possibility of inland settlements in Rarotonga. Undiscovered inland settlements may occur in wider valleys such as Avatiu and Avana.

(p. 152) [3] Mr. Tony Utanga, one of our most reliable informants, told us that one *marae*, exhibiting a similar location, was to be found the valley bottom of Avatiu Stream. Its name is 'Te vaine kamo kai marae.' This *marae* belonged to Ngati Uritaua tribe occupying this valley. It was, however, completely destroyed.

(p. 156) [4] Bellwood lists six types of *marae* in the Table 1 (1978: 11), but he refers to the B3 type and notes that its function cannot be determined with certainty (1978: 26). He also denoted site RAR-51/18 — the only example of B3 type — as a *paepae* on the general Lower Maungaroa plan (1978: Fig. 4). Thus, I excluded this type from my discussion of *marae* morphology.

(p. 159) [5] At site ScMo 103 lying on one of inland ridges of 'Opunohu Valley, Mo'orea Island, several *marae* and other ceremonial structures are "laid out in radial

fashion around a group of large boulders forming a slight knoll on top of a ridge" (Green 1967: 142). This cluster of boulders, while not forming the apparent mound or heap, appears to be an essential element within the architectural complex. In the postulation that such an anomalous element is involved in the ceremonial space, this is similar to several Rarotongan *marae* having a mound or heap of gravel.

(p. 160) [6] There are other well-known *marae* on floodplains, for example RAR-22 and RAR-33. While both RAR-22 and RAR-33 *marae* are heavily disturbed, the architectural elements of RAR-22, at least, are same as those of Case 10 and Case 11, and the collective configuration appears to be common to Case 3 (Wilkes 1974: Fig. 15).

(p. 163) [7] Both Mt. Laemaru (forehead shade) and Mt. Tongaiti (the name of traditional first discoverer) are sacred peaks of Puaikura tribe occupying Arorangi District (Duff 1974a: 24).

(p. 165) [8] This number of thirty-two does not include sites identified as dwellings (MAN-11 and 18) and *'are karioi* (MAN-26).

(p. 174) [9] The only MAN-16 *marae* classified as belonging to Type 1 is neither on a ridge nor on a beach, but lies on the narrow but flat space at the base of scarp which is close to an irrigated taro field.

(p. 177) [10] The linkage of platform to the god of Rongo is also suggested by a traditional dirge (*eva*) which Buck (1934: 176) reported.

(p. 185) [11] The Mangaian political system in late prehistory is characterized by a separation occurring within a mutual dependence of secular power and sacred authority. This feature is similar to the dual paramountship of the late-prehistoric Tongan political system (e.g. Kirch 1984: 223-230). However, the title of *mangaia* — having the supreme domination in secular affairs — was not inherited through a genealogical line, but was usually attained through intertribal conflicts. The office was open to any *toa* or warrior class.

Chapter 5

Discussions on the Diversity of Ceremonial Structures in the Cook Islands

Through an examination of the preceding Cook Island case studies, it has become clear that the ceremonial architecture had a significance unique or peculiar to each island —Tongareva, Rarotonga, and Mangaia. This suggests that meanings encoded in the ceremonial architecture — i.e. architectural structures generally called *marae* in East Polynesia — may be expected to be quite variable from one island or island group to another. In order to interpret such local meanings, it is therefore necessary to refer to the relevant context which is peculiar to each situation. If we can show the archaeologically observed variability of ceremonial structures, it is possible to assume a similar variation obtains in the meanings. In this light, I review the variety of ceremonial architecture in the Cook Islands, look at the situation more widely in East Polynesia, and then show the implication of three case studies.

5.1. Various Ceremonial Structures in Three Atolls, the Northern Cook Islands

As already described in the Section 3.1, all Tongarevan *marae* share morphological elements of a rectangular court and uprights standing along peripheries, and the approximate half of them have a raised platform at one end of the court (see Fig. 3.4.1). Their collective configuration also bears a close resemblance to *marae* of the Society and the Tuamotu Islands. As Emory (1970: 80) suggested, it is therefore entirely conceivable that the original concept of Tongarevan *marae* was introduced from the Tuamotu or the Society Islands, given that they were settled earlier.

It is also true, however, that there are unique characteristics among Tongarevan *marae* which are different to or unknown among those of the Tuamotu and the Society Islands. First of all, in respect of *marae* elements, more than half of Tongarevan *marae* are provided with an unique inner component of two stone arrangements, instead of a platform (see Fig. 3.4.1). This component was not examined in Emory's review of East Polynesian *marae* (Emory 1970). The second difference is that of uprights standing along the sides of the court. Emory (1970: 92) pointed out that Tongarevan *marae* "differ from the Tahiti-Tuamotu design by having not only spaced slab uprights on or along the back of the ahu, but by enclosing the entire court," and supposed that "the Tahitian-Tuamotuan function of upright stones or slabs to designate the position of worshippers and the worshipped is supplanted by their use to define and ornament the court" [1].

In respect of orientations for *marae*, we can also see a homogeneous pattern in Tongareva different from those in the Society and the Tuamotu Islands. It is easily conceivable that in volcanic islands the sacredness would have been imposed on the various topographic features such as mountain peaks, rivers or steams, and the ocean, and multifarious directions of Society Island *marae* are in keeping with this speculation (e.g. Gerard 1978: Fig. 3). Of interest, however, is that in some atolls of the Tuamotu Archipelago— i.e. Reao and Takaroa — their *marae* also show no homogeneous pattern to their orientation: some *marae* are pointed toward the ocean, some are directed toward the lagoon, and others lie parallel to the shoreline. This is contrastive to the Tongarevan pattern where most of *marae* are oriented toward the ocean. A corollary from this difference would be that any directional pattern imposed on ceremonial architecture among atolls is not necessarily related to its environmental setting (such as lack of topographic variations), but resides in some local meaning which has been encoded into the ceremonial architecture through the historical context peculiar to each island or each district.

Given the *marae* evidence from Tongareva reviewed above, its ceremonial architecture thus appears to exhibit the basis for inferring a set of meanings

quite different to those of the Society and the Tuamotu Island *marae*. Since 1985, Keio University has also carried out archaeological researches other three atolls of the Northern Cook Islands: Manihiki, Rakahanga and Pukapuka. In due course publications from these archaeological programs, currently in progress, will provide fuller descriptions of their ceremonial structures. Here, however, a brief summary will suffice for comparative purposes.

5.1.1. Ceremonial Structures in Manihiki Atoll

In Manihiki and Rakahanga, the public religious gathering places were termed *marae* as in Tongareva and other East Polynesian islands. Buck (1932b: 208) stated that there were only three *marae*, each constructed at places close to modern villages in both atolls. Moreover, all of them were said to have been utterly demolished during the early Christian period. Yet, in Manihiki Atoll — approximately 360 km distant from Tongareva — we found several architectural features called *marae* by the people on some islets currently uninhabited, although many of them were indeed considerably disturbed (Fig. 5.1.1, see also Yamaguchi 1998).

These ceremonial structures may be classified into at least three groups. Architectural features of the first group are characterized by a rectangular court. Site MNH-4 (Ngarikura Marae) is one of this group (Fig. 5.1.2). Judging from well-preserved western part, the site is supposed to have originally been a rectangular court enclosed with curbstones, each about 20 cm high. Although no upright remains standing along the periphery, just inside the curbstone line there is a row of coral slabs lying on the ground. There is also a stone arrangement at northern end (the oceanside) of the court, which appears to be similar to the inner component of Tongarevan Type B *marae*. At the southeastern part — probably the outside of court — a mound of coral blocks exists, although it is not clear whether or not it was a mounded oven for ceremonial cooking.

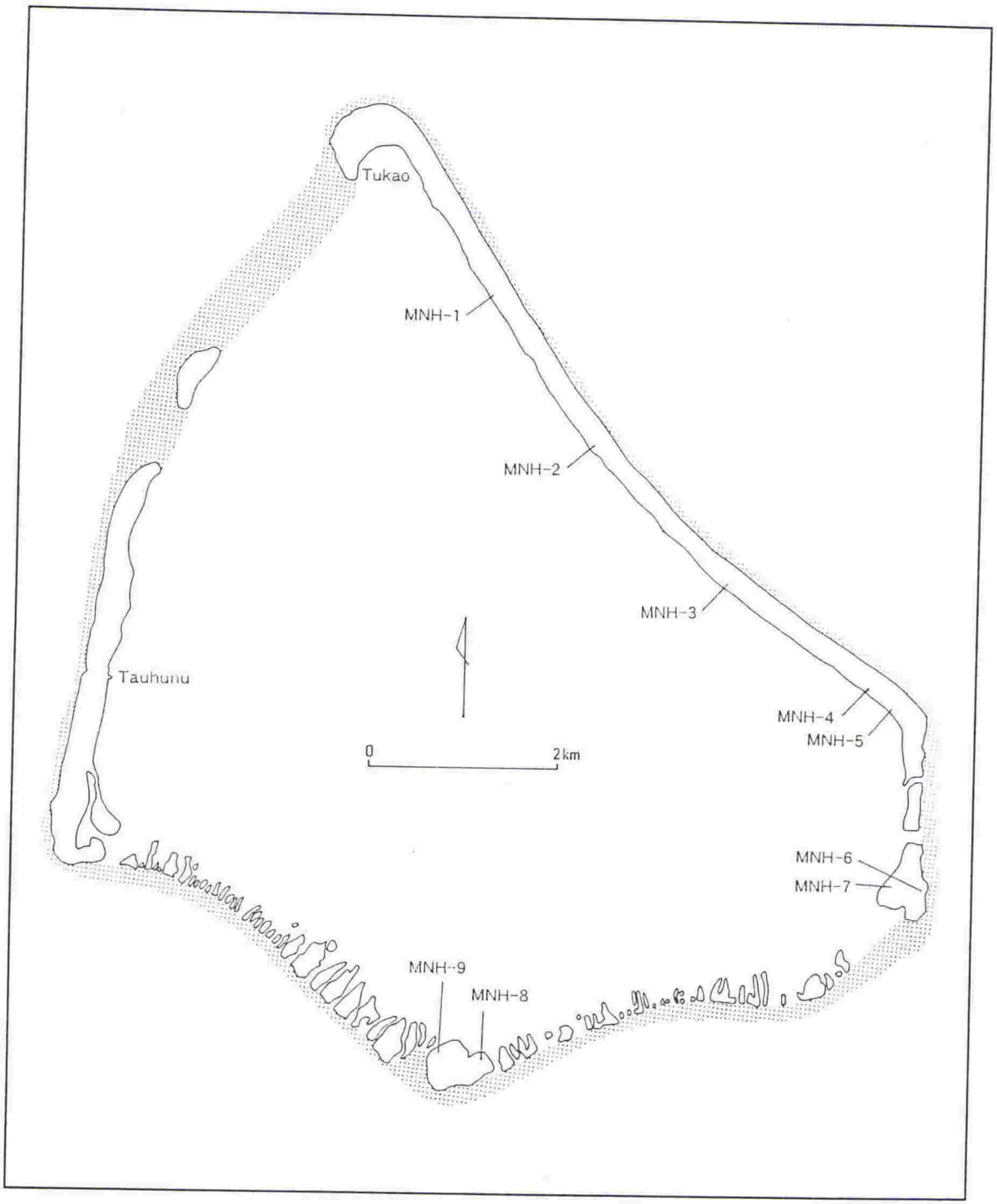

Fig. 5.1.1. Site distribution in Manihiki Atoll, the Northern Cook Islands

Keio University carried out archaeological researches of Manihiki Atoll in 1990 and 1991, and surveyed 9 sites including 8 ceremonial sites (MNH-1 Koronui Marae, MNH-2 Maramanui Marae, MNH-3 Tu Teru Matua Coronation Marae, MNH-4 Ngarikura Marae, MNH-5 Vaitaria settlement site, MNH-6 Fua-i-heke-rangi Marae, MNH-7b Te Maru Marae, MNH-8 Kahuirau Marae, MNH-9 Te Marae).

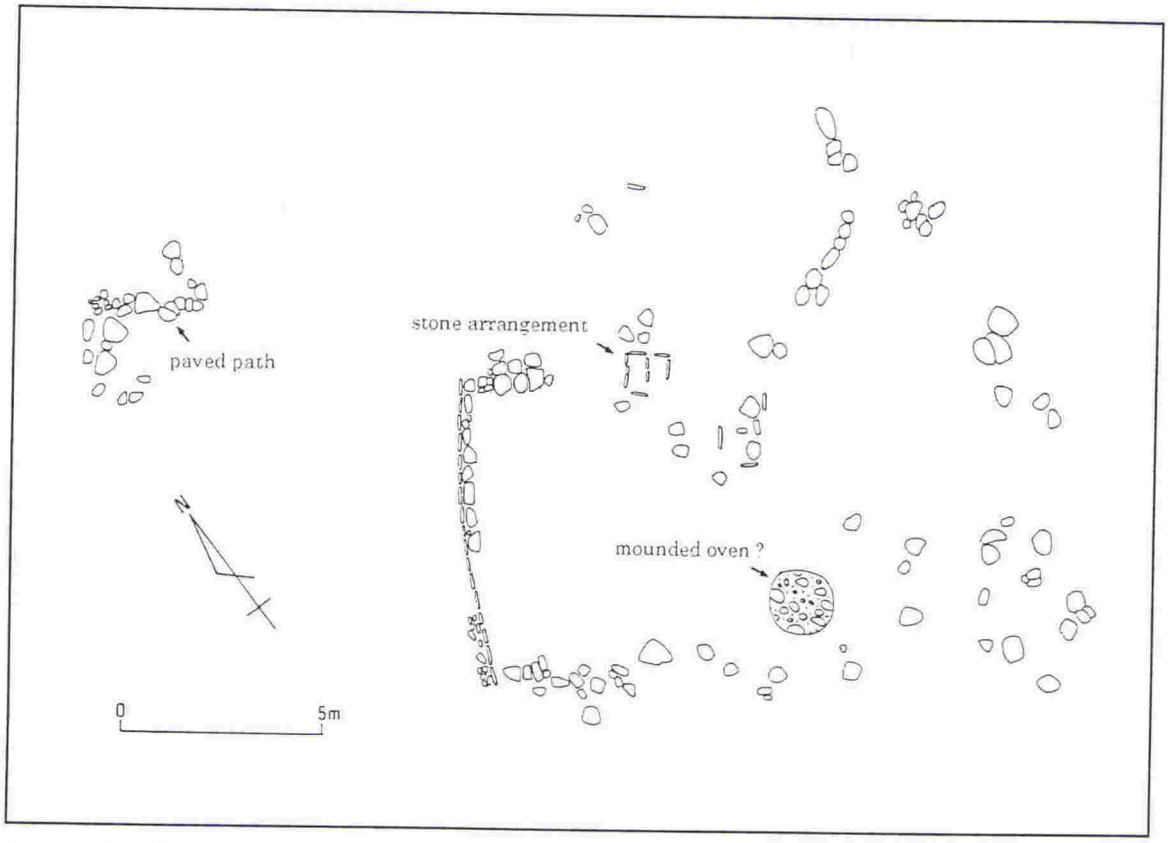

Fig. 5.1.2. MNH-4 Ngarikura Marae in the islet of Ngake, Manihiki Atoll

In Manihiki there are some rectangular courtyards with enclosing curbstones, but there is no site exhibiting any trace of a platform (*ahu*) within court. MNH-4 *marae* is one of them. At the northern end facing the ocean is a small stone arrangement of low slabs, the design of which is similar to the inner component of Tongarevan Type B *marae*. A paved path running parallel to the lagoon shore approaches the northwestern part of the court.

Of interest is that the paved path running parallel to the lagoon shore extends directly to this site. Similar paths were also observed at other ceremonial sites. It is likely that special approaches to ceremonial spaces from dwelling areas were deliberately defined. Site MNH-8 (Kahuirau Marae) in the islet of Porea probably also fits into this first group typologically.

The second group consists of small and low, rectangular platform-like structures enclosed with curbstones, which are a type unrepresented in Tongareva. These are about 10 cm high from the ground, and infilled with coral gravel. It may be thus more proper to view them as foundation

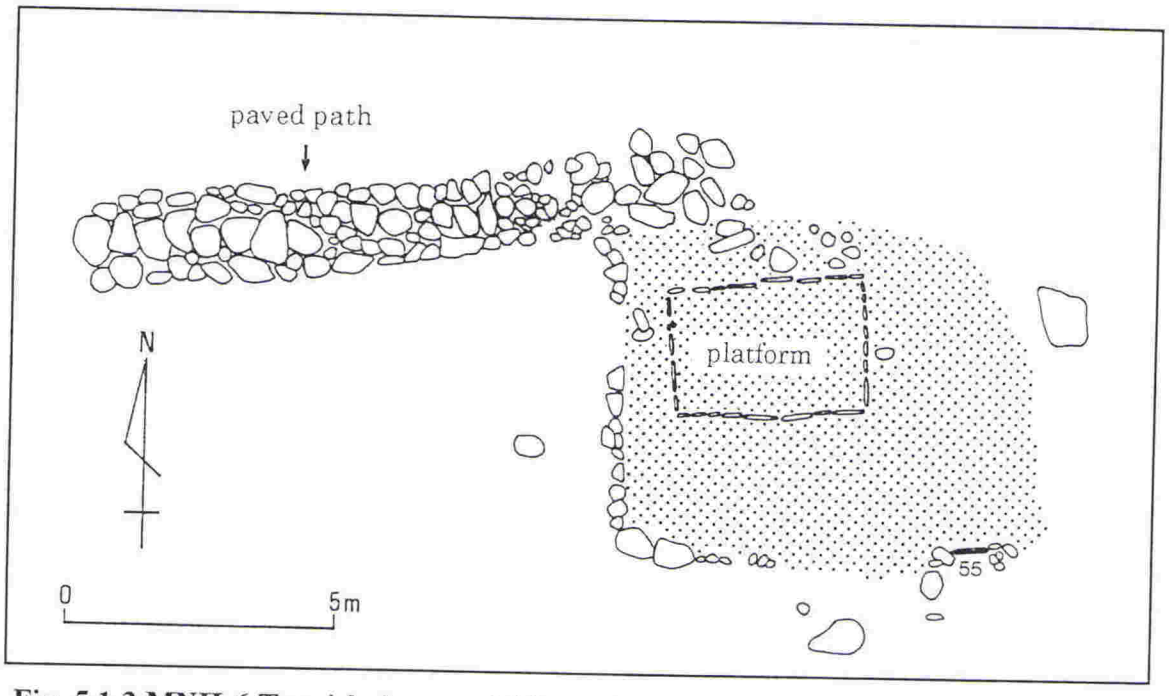

Fig. 5.1.3 MNH-6 Tua-i-heke-rangi Marae in the islet of Motu Hakamaru, Manihiki Atoll

In Manihiki, there is also other group of ceremonial structures. These are mainly characterized by a foundation platform, which is supposed to have been the foundation of a small shed. Site MNH-6 — located at the oceanside of Motu Hakamaru — is one of this group. A paved path approaches this site from the inland. The name of Tua-i-heke-rangi literally means "the side where it (probably this marae) descended from the heaven."

platforms. In fact, a small excavation at site MNH-9 (Te Marae), one of the second group, revealed a posthole at one end of long axis drawn between centers of both sides (Yamaguchi 1991a: Fig. 2). This suggests that a small shed supported by two posts was built on the foundation. MNH-6 *marae* (Tua-i-heke-rangi Marae) is another of those sites classified as belonging to the second group (Fig. 5.1.3). This ceremonial site is the only known example located at the oceanside. The site consists of a rectangular court enclosed with flat slabs lying on the ground. An upright, about 55 cm high, stands at the southeastern end of its court, and a foundation platform within the court. Of special interest is that a well-paved path is attached to this site. The pavement extends more than 100 m to the inland, and finally goes out of sight. The possibility exists that this paved path forms a deliberately defined approach to the sacred space, in the same way as the path at MNH-4. It was

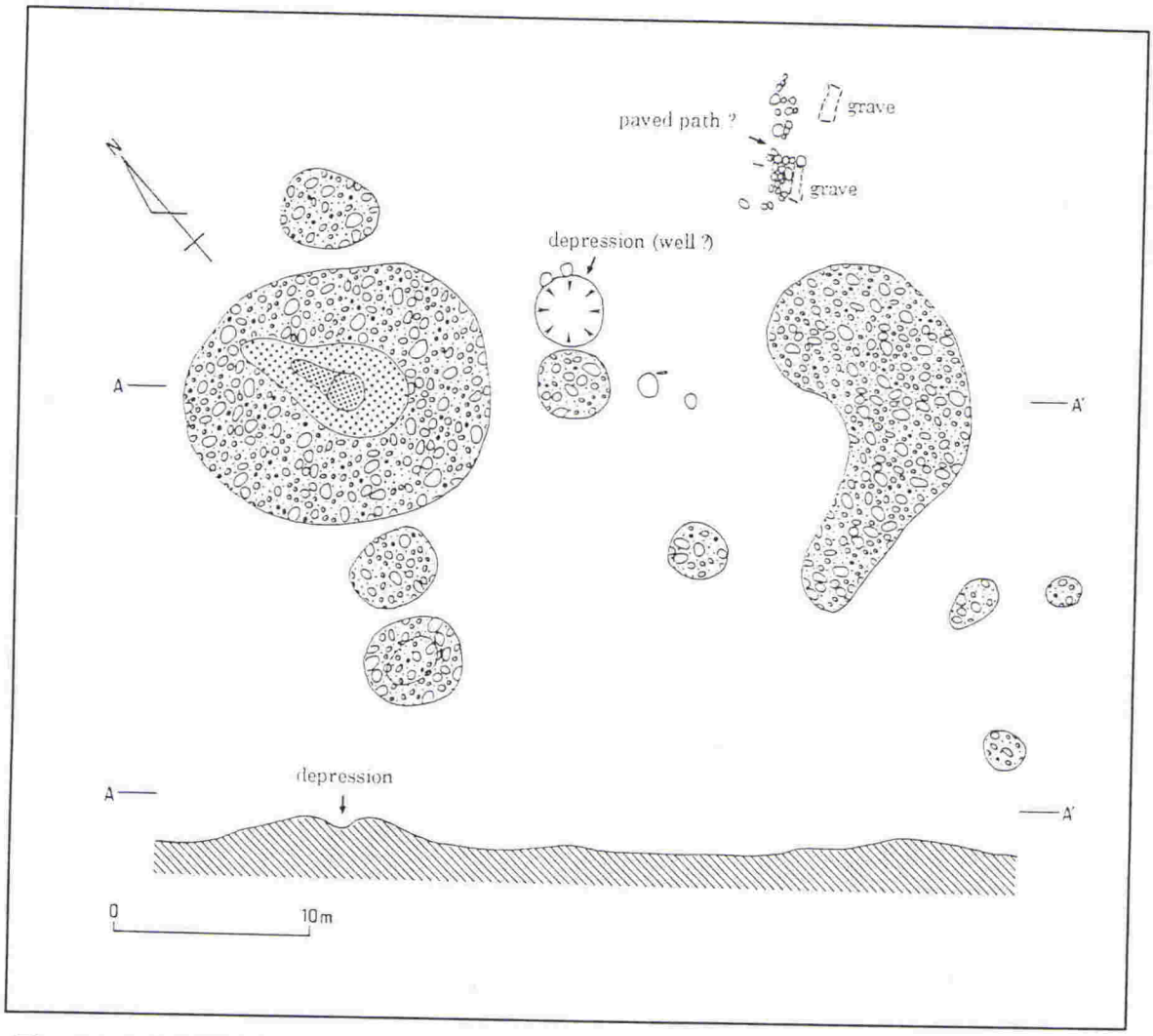

Fig. 5.1.4. MNH-2 Maramanui Marae in the islet of Ngake, Manihiki Atoll

There are two ceremonial sites consisting of large mounds of coral gravel and boulders in Manihiki. Some of mounds are quite similar to "turtle ovens" in Tongareva. This similarity suggests that turtle ceremonies were performed in Manihiki as well. MNH-2 Maramanui Marae is probably one of these places, which is the largest and the most impressive ceremonial sites.

said by one of our informants that the people used to chant commemorating historical events (*pehe*) at this place. In addition to these two sites, there is a third, MNH-7 (Te Maru Marae), also classified as belonging to this second group.

The last group includes those ceremonial sites characterized by mounds of coral gravel and boulders. These too are called *marae* by the people. Besides mounds ancillary to other architectural features, there are two sites

consisting of huge mounds, MNH-1 and MNH-2. In particular, site MNH-2 (Maramanui Marae) is the most impressive and largest ceremonial site in Manihiki. Within the confines of this site ten mounds, of varying in size, are scattered about in no obvious pattern (see Fig. 5.1.4). While not all mounds are ovens — some of them are probably reserves of heating materials — the largest circular one is certainly a mounded oven for ceremonial cooking. It has a central hollow on the top, a feature which is consistent with a major characteristic of a "turtle oven" in Tongareva (site TON-1). In addition to the mounds, there is also a depression for a well, a pavement which is supposed to be a part of paved path, and two (perhaps recent) stone-outlined graves.

5.1.2. Ceremonial Structures in Rakahanga Atoll

A smaller atoll called Rakahanga is located only 42 km north of Manihiki. Both atolls are occupied by a people traditionally descended from the same group of settlers. The whole population once lived on one atoll for a year and then moved back and forth from one atoll to the other, until 1852 AD when the missionaries persuaded the people to divide and settle permanently on each atoll in order to prevent so many from loosing their lives during voyages (Buck 1932b: 4, 8) [2]. According to a folk tale, it seems that these inter-atoll voyages were promoted by depletion of food resources, in particular coconut and *puraka* (*Cyrtosperma chamissonis*) (Kauraka 1982: 17). While the close affinity and the shared socio-political system between two atolls are undoubtedly strong, the main ceremonial structure (RAK-2) in Rakahanga appears to differ somewhat from any of three types of structures in Manihiki described above.

Ceremonial sites in Rakahanga are concentrated on Te Kainga, a small islet adjoining the modern village (Fig. 5.1.5) [3]. Site RAK-2 is located at the approximate center of the islet. A large upright, circa 120 cm high, stands on it and coral blocks are scattered about the perimeter (Fig. 5.1.6). Judging from the position, this site is probably Mua Marae which was a public or

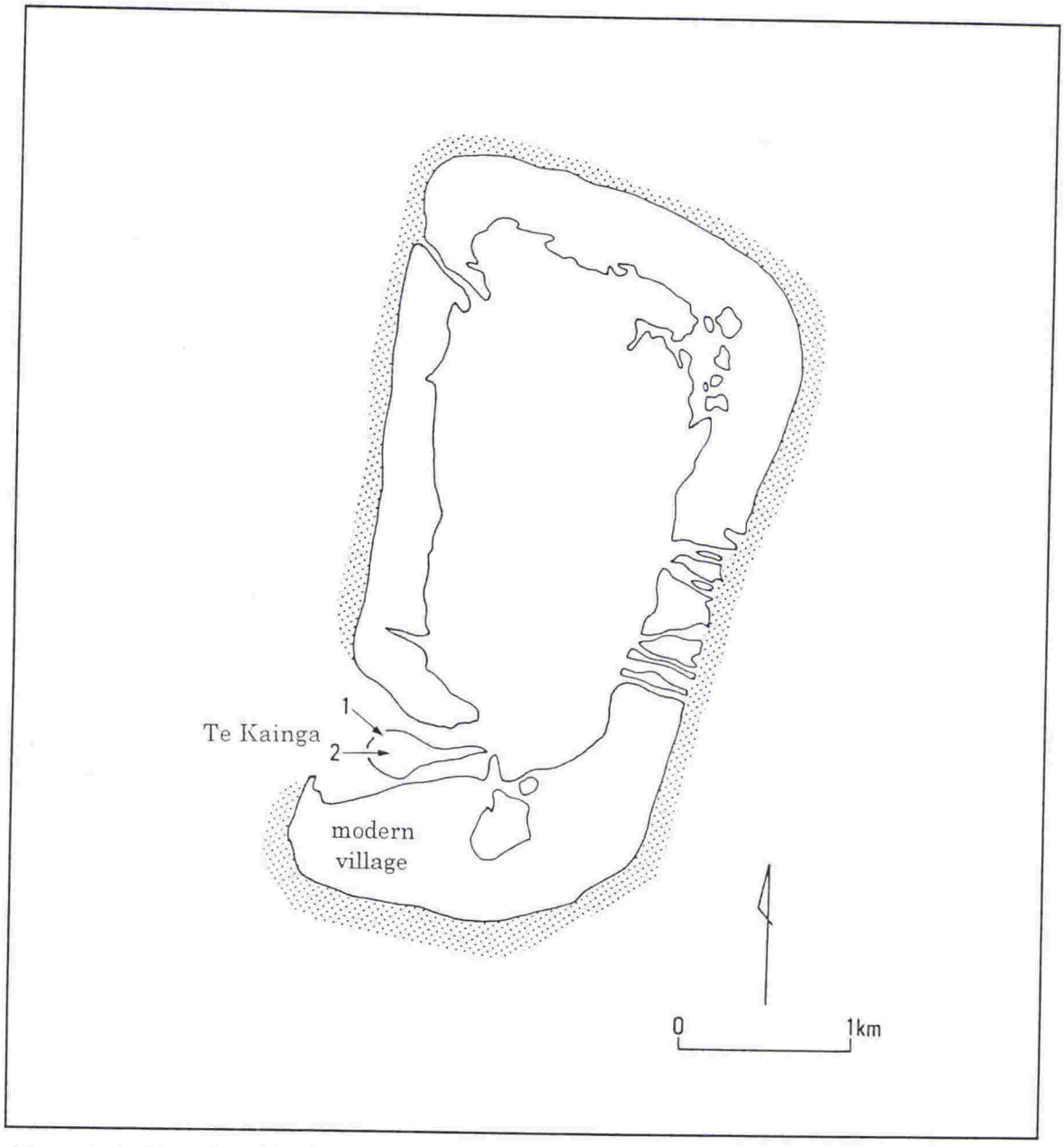

Fig. 5.1.5. Site distribution in Rakahanga Atoll, the Northern Cook Islands

Keio University carried out an archaeological research of Rakahanga Atoll in 1990. Since the research period was limited, we concentrated on Te Kainga, a small islet adjoining to the modern village, and excavated two ceremonial sites — a large mound of coral gravel and boulders called Ivikakekake (RAK-1), and Mua Marae (RAK-2).

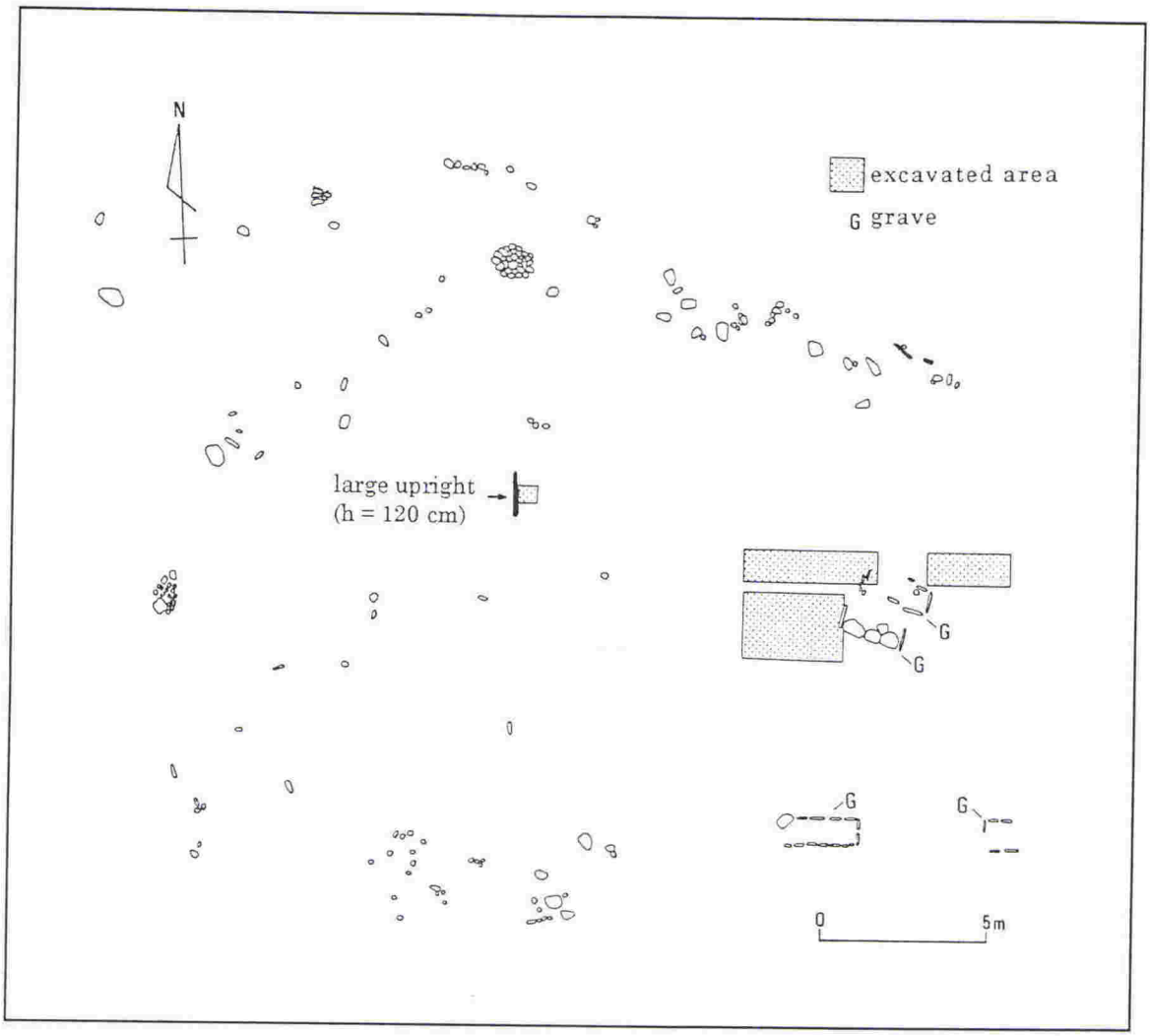

Fig. 5.1.6. RAK-2 Mua Marae in the islet of Te Kainga, Rakahanga Atoll

A large upright stands at the center of this site, and coral blocks and slabs are scattered around it. The original plan is unclear, but it is said to have been paved. If so, it is likely that this ceremonial site was not similar to any *marae* in Manihiki as well as Tongareva.

"national" *marae* serving "all lineages (*matakeinaga*) when they united for a common function" (Buck 1932b: 209). Today the whole plan lacks any real coherence, but the court is said to have been paved (Buck 1932b: 209). In support of this, we exposed some slabs beneath the surface soil in an excavated unit. If so, the original design of Mua Marae would have been very different to any *marae* in Manihiki as well as Tongareva. A dated charcoal sample from Layer 2, lying under these slabs, indicates that the construction of Mua Marae post-dates 15th century AD (N-5877: 1302 - 1441 Cal. yr. AD).

This does not mean, however, that ceremonial activities were not performed before the date. We also retrieved a turtle plastron from layer 4. This yields the earliest radiocarbon age, 892 - 1030 Cal. yr. AD (N-5874), for the atoll. It is therefore likely that turtle ceremonies go back to the early settlement period.

Te Kainga also contains a large mound of coral gravel and boulders (RAK-1) near the northwestern beach, approximately 80 m distant from Mua Marae. This mound, called "Ivikakekake", measures 11 m by 9 m in size and 50 cm in height. Although this mound has no depression at the top, it too is supposed to have been an oven for the ceremonial cooking of turtles. In support, several fragments of turtle plastron were retrieved from the excavated trench. Radiocarbon dating of charcoal samples from our excavation showed the lower layer to be dated at 1269 - 1475 Cal. yr. AD (N-6139) and the upper layer at modern (N-5869) — i.e. with the last 150 years. From this, it would seem likely that the ceremonial cooking of turtles had sifted from the center of Te Kainga to this oven, following the late construction of Mua Marae.

5.2. Ceremonial Structures in Pukapuka Atoll

Pukapuka Atoll is at the northwestern corner of the Cook Islands, approximately 290 km distant to Manihiki and Rakahanga. While the atoll is more than 640 km distant to Samoa, it appears to be linguistically and culturally closer to West Polynesia than Tongareva, Manihiki and Rakahanga. This is also the case with its ceremonial structures (this issue will be taken up again in Section 5.4), and thus the descriptions are presented here separately from those of other three atolls in the Northern Cook Islands.

The landform of Pukapuka consists of three islets around the lagoon —

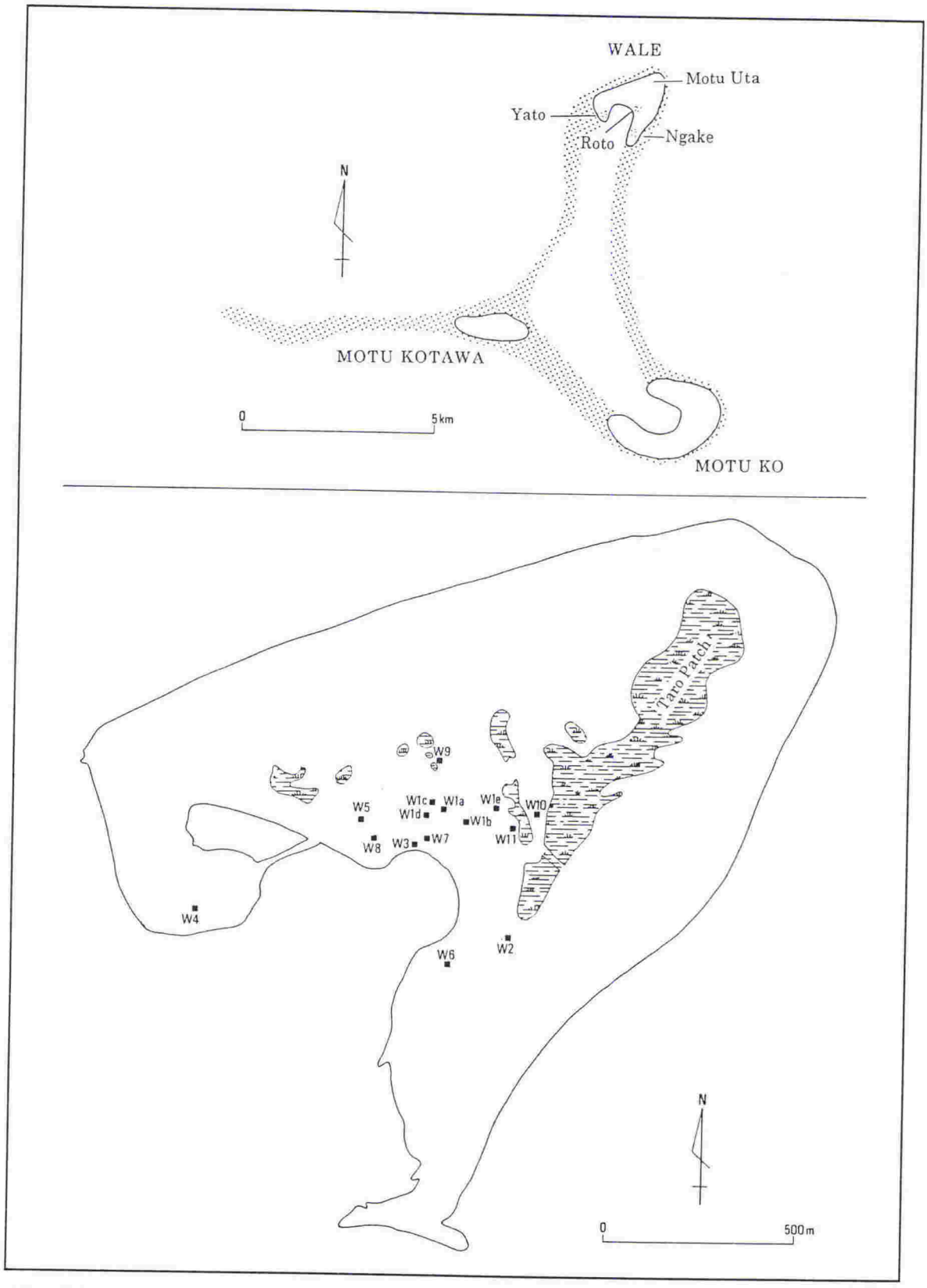

Fig. 5.2.1. Pukapuka Atoll, the Northern Cook Islands, and site distribution in the islet of Wale

Keio University carried out archaeological researches of Pukapuka in 1985 and 1995. Site PUK-W10, called Mata Ala, is the only surviving ceremonial site at present.

Wale, Motu Ko, Motu Kotawa (Fig. 5.2.1). Currently all the people are settled in one of three villages — Ngake, Yato and Roto — constructed on the lagoon (southern) side of Wale Islet (Fig. 5.2.1, upper). Each of the lands of Motu Ko, Motu Kotawa and the northern half of Wale, termed Motu Uta, is controlled by each village as reserved land for resources, in particular for wet-taro cultivation and for coconut tree plantations.

In the language of Pukapuka "*malae*" occurs as a term, but it does not mean a sacred structure. Instead, it is an open space used for sports competitions (Beaglehole & Beaglehole 1991: 17) [4]. Beaglehole & Beaglehole — who carried out their seven month field survey in 1937 — enumerated five terms representing sacred spaces: *awanga ya*, *wale atua*, *yionga*, and *putu* (Beaglehole & Beaglehole 1938: 317). Among them "*awanga ya*" are round or oval enclosures on which priests communicated with the gods (Beaglehole & Beaglehole 1938: 160). These enclosures were claimed to have had two gaps as entrances with a large coral block in the center. According to observations of traces of these structures by Beagleholes, it is likely that they consisted of an oval court of 7 - 10 m in diameter, enclosed with low coral slabs set on edge (approximately 40 cm in height). The term "*wale atua*" means a god house, in which each priest of a lineage had a seat next to a main ridgepost. Other morphological features of *wale atua* are not clear. According to the information given by Beaglehole & Beaglehole (1938: 318), ridgeposts of these house served as positions of sacred seats for priests to sit. The next term "*yionga*" was applied to cleared avenues of ancestor gods, which were bordered by coconut trees. The last term "*putu*" represented simple shrines, one of which was said, according to Beaglehole & Beaglehole (1938: 318), to have consisted of small raised platforms of stone or coral pebbles, about 120 cm square and 60 cm high [5].

Unfortunately, none of the above structures remained in 1995 when people from Keio University carried out archaeological research on the atoll. At the center of Wale (the main islet) between Roto Village and the reserve land (Motu Uta), however, there is another candidate of ceremonial site.

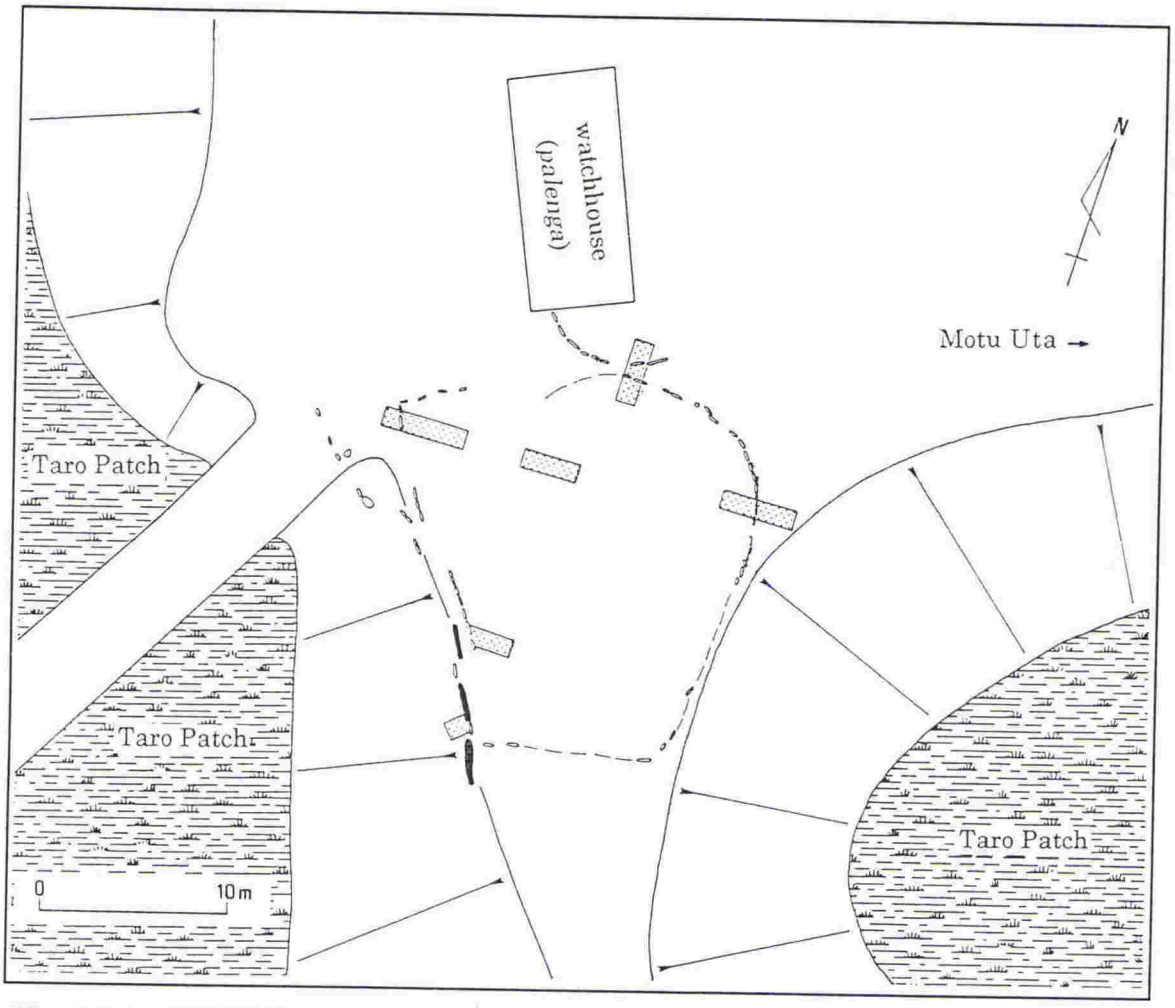

Fig. 5.2.2. PUK-W10 ceremonial site (Mata Ala) in Wale, Pukapuka

This site is located at the center of the islet of Wale, between Roto village and the reserve land (Motu Uta). It consists of an oval enclosure edged with curbstones and three large uprights standing along a taro patch. According to ethnographic account, it is likely that this site was the ceremonial entrance to Motu Uta.

This site (PUK-W10) — called Mata Ala — was investigated in the 1995 expedition. Mata Ala is claimed by the people of Pukapuka to be "*palenga*" which means a "guard's watchhouse in reserve food land." There is certainly the watchhouse of Motu Uta (on the reserve land of Roto Village) in this area. The term, however, has another meaning of "entrance to underworld" (Beaglehole & Beaglehole 1991: 27), which suggests the term bears some sort of sacredness [6]. In fact, three large uprights stand in the area of Mata-ala, and from this point of view it would be legitimate to interpret this site as a ceremonial entrance to Motu Uta, the reserve land which was probably

protected by the sacredness except in the period when it was opened to members of Roto Village.

The investigation, including excavations of three trenches, revealed that this site consisted of a large oval enclosure, in addition to the three uprights noted above standing along the edge of a taro patch (Fig. 5.2.2). One of excavated trenches exposed a posthole, which lay at the inner edge of enclosure. This indicates that a house structure probably existed on this oval enclosure. Judging from its stratigraphic context and the result of radiocarbon dating, it is evident that this "housing" enclosure co-existed with uprights in late prehistory. Of special interest is the fact that this area — reaching 3 m above the sea level — had been artificially formed. The excavations revealed that more than 1 m deep spoil from surrounding taro patches had been quickly piled up on this area. It means that the ceremonial structures of Mata Ala were built after the construction of surrounding taro patches. This strongly suggests an association of the ceremonial structures with taro patches in the reserve land (Motu Uta) of Roto Village.

As already mentioned, other sacred enclosures (*awanga ya*) and god houses (*wale atua*) no longer exist, but the ethnographic information indicates that these structures constituted a ceremonial unit for each paternal lineage (*po*) along with its lineage cemetery, and that each set of structures was situated close together in a lineage's land (Beaglehole & Beaglehole 1938: 318). This information tends to suggest that the site of Mata Ala may have served as a ceremonial unit at the level of village — consisting of a god house or a "watchhouse", and upright stones representing village gods.

5.3. The Variety of Ceremonial Structures in the Southern Cook Islands

The previous discussion has made evident, ceremonial structures in the

Northern Cook Islands were not necessarily homogeneous. Not only can we identify various characteristics which are not discernible in *marae* of the Society and Tuamotu Islands, but also point to the considerable diversity even among these four atolls. In order to examine such diversity further, I summarize ceremonial structures in the Southern Cook Islands comprising Rarotonga, Aitutaki, Mangaia, Atiu, Mitiaro and Mauke.

5.3.1. Ceremonial Structures in Rarotonga

As set out in Section 4.1, Rarotonga is one of the more appropriate islands in the Cooks in which to demonstrate the diversity of its ceremonial structures. In this island, there are various groups or categories of architectural features — T-shape *paepae, 'are kariei* and *koutu* —which differ from others in respect of their main functions as well as their physical characteristics. In addition, and what is more striking, is many variations of ceremonial structures called *marae* (see Fig. 4.1.13 and 4.1.14). Bellwood (1971: 147) suggested, on limited evidence, that Rarotongan *marae* are "mainly of the pavement and ahu type typical of Tahiti." There are certainly some structures consisting of so-called basic elements of East Polynesian *marae*, but the reality is not so simple. For this reason, it is not possible to summarize Rarotongan *marae* in such a short sentence. Instead, it is perhaps better to say that there is no typical *marae* type present in this island, as the variations in construction are many, and they have to be approached from that point of view.

5.3.2. Ceremonial Structures in Aitutaki

Marae of Aitutaki Island appears to be somewhat homogeneous in comparison with those of Rarotonga, although they can be classified into several morphological types. Bellwood (1969: 525-6; 1978: 93) classified *marae* of Aitutaki into five types, as shown below:

Type D1 — Single, or paired uprights facing to each other;

Type D2 —Uprights arranged in parallel rows. Well-preserved sites also have a single upright standing apart from the main alignments of uprights but facing toward them;

Type D3 —*Atarau* of orthostatic construction, without any alignments of uprights. *Atarau* is basically a cist of upright basalt slabs, and the rectangular inside is left empty;

Type D4 —Alignments of uprights which are parallel with each other in the same way of D2 *marae*, and a single *atarau* situated apart from the alignments but facing toward them. But, one of D4 *marae* (AIT-25) has two components identified as *atarau*;

Type D5 —Rectangular pavement.

Most *marae* which survived at the time of Bellwood's investigations, however, fell into Type D2 or D4. In addition, among the structures of Type D1 are some *marae* (AIT-32 and AIT-34) which would better be classified into Type D2, and one of the D3 *marae* (AIT-37) may well be included in Type D4 [7]. If these reclassifications are valid, among twenty-one *marae* surviving at the time of Bellwood's research, at least fifteen sites are Type D2 or D4.

A noticeable point is the co-ordination of configuration between D2 and D4 *marae*. Certainly, the former type are not provided with *atarau*, but assuming that a single upright in D2 *marae* is functionally or semantically equivalent to *atarau* in D4 *marae*, the collective configurations of both types can be viewed as homogeneous. In fact, both *atarau* and a single upright are arranged so as to occur at the similar positions in *marae*, that is they are apart from the alignment(s) of uprights but face toward them (Fig. 5.3.1). In other words, most *marae* in Aitutaki follow a basic design in their collective configuration and this consists of two parts: alignment(s) of uprights which is/are probably position markers for persons attending ceremonies, and an *atarau* or a single upright which is thought to have been the focal point of ceremonies [8].

It is not correct, however, to think that ceremonial structures in Aitutaki

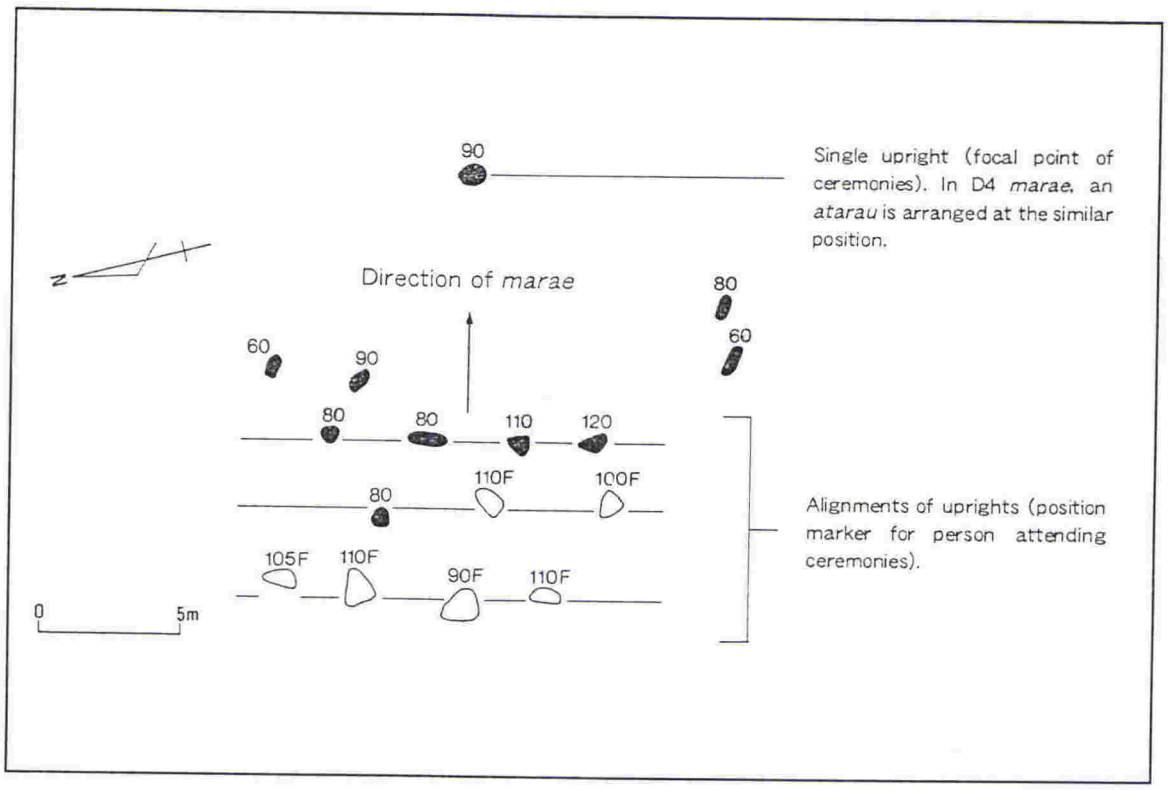

Fig. 5.3.1. Type D2 *marae* (AIT-35) in Aitutaki

This diagram is modified after Bellwood (1978: Fig. 62). Numbers indicate heights of uprights in cm, and "F" means a fallen upright. It is supposed that most *marae* in Aitutaki follow a basic design of collective configuration which consists of two parts. One of them is alignment(s) of uprights serving as position markers for person attending ceremonies, and another is a single upright (in D2 *marae*) or an atarau structure (in D4 *marae*) serving as the focal point of ceremonies.

do not show any diversity at all. For example, Buck (1927: 209) described a *marae* (AIT-6) having a rectangular pavement, although it was heavily disturbed when Bellwood visited it. Bellwood reported a structure called *'Are Kariori* (AIT-2) which also had a rectangular pavement. Examining orientations of D2 and D4 *marae* — the direction of perpendicular axis to alignments of uprights which faces to a single upright or *atarau* structure of each site — it becomes clear that there are some variations: toward the ocean or the lagoon, toward the hilly inland, and parallel to the shoreline. In addition, it appears that a degree of sacredness may have been imposed on some topographic elements. For instance, two basalt stones standing on the top of a hill (AIT-12) are claimed to represent the gods of Tangaroa and Rongo, and an unusual indentation in the top of a basalt block (AIT-21) is believed to

be the footprint of Tane (Bellwood 1978: 97, 103).

It is therefore likely that various objects — not invisible gods but cultural and natural objects which symbolize such gods and are visible — were worshipped or viewed as sacred in the religious sense, although the basic design and its collective configuration suggest that the form of ceremonies was to a large degree homogeneous in the island of Aitutaki.

5.3.3. Ceremonial Structures in Mangaia

Most Mangaian *marae* have coordinate characteristics: (1) all *marae* are rectangular, (2) they are enclosed with coral slabs or blocks, (3) most possess courts which are raised or terraced by the common technology of filling enclosures with soil, and (4) uprights of coral or stalactite stand around peripheries of a number of *marae* (Fig. 5.3.2, and see also Section 4.2 and Table 4.2.1).

Certainly some variations are seen in the structure of courts — terraced or raised — and the proportion of courts, but it is likely that these variations are related to the differences of topographic constraints rather than to the functional or semantic aspect of ceremonial activities. A few of morphological elements might be assumed to have been related to a functional or semantic purpose. An example would be the small rectangular enclosure lying at the southeastern end of site MAN-26 which was described as an 'Are Karioi (see Bellwood 1978: Fig. 76), and another the platform of three *marae* dedicated to the god of Rongo, the supreme god in Mangaia — MAN-17, 25 and 29.

As a whole, Mangaian *marae* have morphological characteristics different from those of Aitutaki as well as Rarotonga, and yet show much more homogeneity in form in relation to their collective configuration. It is also worthy of note that a similar degree of homogeneity is seen in locations of *marae* — most *marae* are close to irrigated fields of wet taro. This is not the

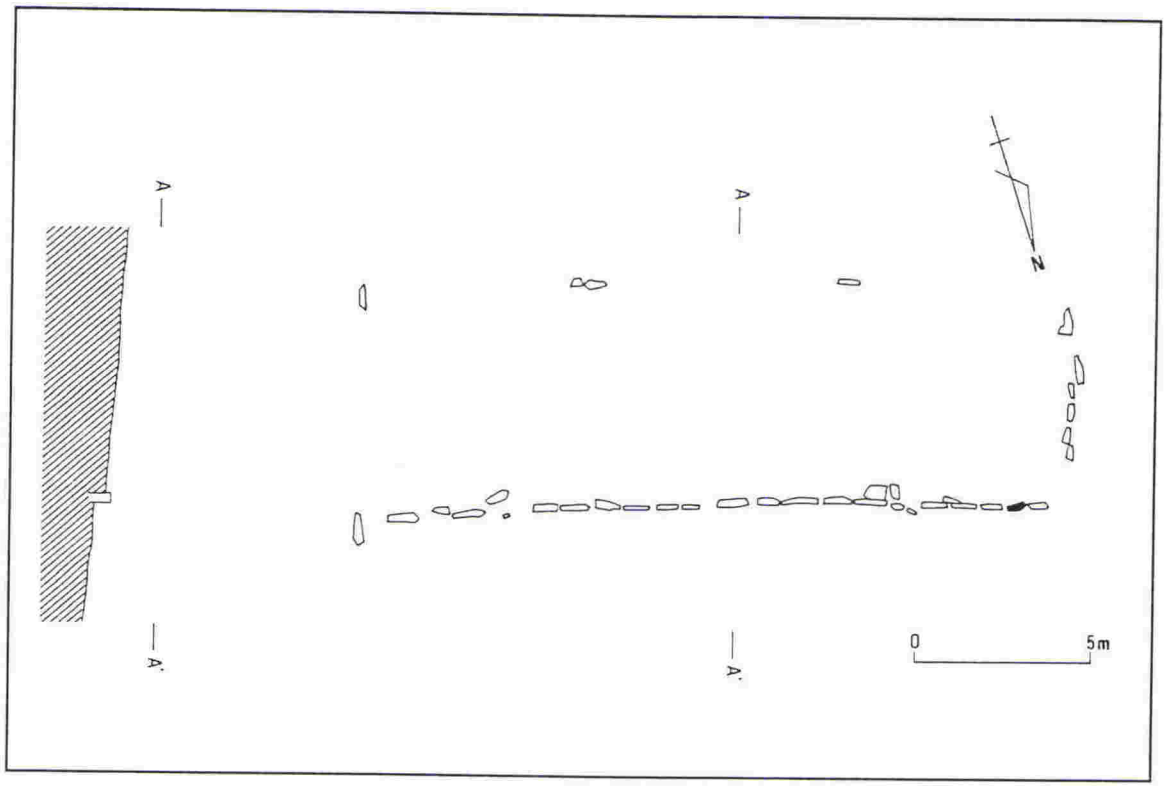

Fig. 5.3.2. MAN-10 Aumoana Marae in Mangaia

As a whole, Mangaian *marae* have morphological characteristics different from those of Aitutaki as well as Rarotonga, and also show much more homogeneity in relation to collective configuration. They basically consist of the terraced or raised rectangular court which is faced with coral slabs. In addition, coral or stalactite uprights stand around peripheries of the court, in particular at the corners. Site MAN-10 — the diagram taken from Chikamori's report (1990: Fig. 3) — is one of typical *marae*.

case in Rarotonga or Aitutaki, and Mangaian *marae* add yet another dimension to the variation in the kinds of *marae* found in the Cook Islands.

5.3.4. Ceremonial Structures in Ngaputoru

The remaining three islands in the Southern Cooks — Atiu, Ma'uke and Mitiaro which are raised coral reef or *makatea* islands — comprise the traditional political unit called Ngaputoru (Walter 1994: 222) [9]. These islands lie within a day and a half sailing time of each other, and according to ethnographic accounts, voyaging within Ngaputoru appears to have taken place regularly (e.g. Williams 1837: 43). While ceremonial sites of these

islands have so far not been systematically well surveyed, valuable information on them can be obtained from some of the more general archaeological reports (Trotter 1974; Walter 1993; 1996a).

In Atiu only eight *marae* have been recorded. These include definite *marae* assumed to be protohistoric and those whose status are unclear archaeologically yet are stated to be *marae* by the people — AT-9, 11, 13, 16, 17, 20, 27 and 29 (Trotter 1974:104-119). Among the distinctive features of *marae* in the island are the widespread use of well-shaped coral slabs and stalactite sections, some of which are massive sections surprisingly reaching more than 5 m long and 60 cm in diameter (Duff 1974: 94). The slabs and stalactites were prized from the ceilings of the inner chambers of large caves honeycombing the coastal barrier of raised coral (*makatea*). Of special interest here, however, is that *marae* in Atiu show a diversity of collective configurations, as Walter (1996a: 70) points out. The diversity is observable even among three large *marae* which were described in detail by Trotter.

One of these three is Orongo Marae (AT-11) located in the northwestern district (Ngatiarua). This site consists of a L-shaped wall of coral blocks which is probably the part of a rectangular enclosure measuring about 50 m by 30 m in size, and a row of stalactite sections at the center of courtyard (Trotter 1974: Fig. 45). Approximately 100 m to the northwest is another *marae* called Marau (AT-9), which shows a different configuration from AT-11 *marae*. The main structure consists of a square platform measuring 6 m by 6 m in size and 1m high covered with coral gravel and faced with coral slabs. A row of small stalactites lies across the surface of the platform (Fig. 5.3.3). The last one is Marae Vairakaia (AT-20) in the central eastern district (Temgatangi). This *marae* comprises a 37 m long wall of forty seven coral slabs — six of them are recessed on either side on top to produce the effect of a head-like projection. These slabs face an artificial terrace at the skirt of a hill slope (Trotter 1974: Fig. 49). On the terrace itself, no component occurs except for a row of stalactites lying along the wall.

Fig. 5.3.3. *Marae* in Atiu, the Southern Cook Islands

Marae in Atiu show the diversity. The upper is Marau Marae (AT-9), and the lower is Marae Vairakaia (AT-20). Both structure consist of coral slabs, but quite differ from each other in collective configuration.

While these architectural features in Atiu are of the same materials, such as coral slabs and stalactite sections, collective configurations are not similar to each other, and also appear to be different from any ceremonial structures in other islands of the Southern Cook Group. What is likewise intriguing is that *marae* in Mitiaro appears to be distinctive, although Ma'uke *marae* are basically similar to the platform of Marau Marae (AT-9) in Atiu — which consist of low square platforms infilled with coral pebbles (Walter 1993: 74; 1996a: 70). According to Walter's descriptions, remains of *marae* occur both in the inland and on the coast outside the *makatea*. "Inland *marae* come in two basic forms. In the first, low alignments of coral rubble enclose small platforms and uprights. Elsewhere there are coral lined platforms of about 1 m in height enclosing areas of up to about 500 m^2 and with uprights or flat coral slabs of ceremonial significance. On the coast, complexes of structures include stone curbing and the open, coral cist ··· measuring about 2 by 3 m and up to 1 m in height" (Walter 1996a: 73). In addition, in one of them there appears to have been an architectural feature (Te Rua Roa Marae) of a quadrangular pavement with *ahu* and uprights (Walter 1996a: 73). The limited but valuable information suggests that ceremonial structures in the three islands show a high degree of morphological diversity, despite the known socio-political connection obtaining among these three societies in the past.

5.4. Culture Historical Approach and Its Limitation

We have examined various ceremonial structures in the Cook Islands both in the Northern and Southern regions. Among many of them some common characteristics are certainly discernible such as uprights, but their collective configurations are not at all homogeneous. This is out of keeping with the prevailing image that East Polynesian ceremonial structures share the basic morphological elements of "an enclosed or otherwise delineated courtyard, elevated altar area (*ahu*), and upright stone slabs or carved

images" (Kirch 1982: 80; see also Bellwood 1978: 87).

This image appears to have been formed on the basis of more than 360 *marae* in the Society and the Tuamotu Islands which were surveyed in 1920s and 1930s in a part of salvage surveys of the Bishop Museum (Emory 1933, 1934a, 1947). The geographically vast area occupied by these particular island groups within the East Polynesian sphere and the overwhelming number of sites reported and described would have contributed to the emphasis on their 'basic elements', although a few scholars have already perceived the much greater variety of ceremonial structures in East Polynesia (e.g. Emory 1970: 73; Bellwood 1970: 100, 102).

In the Cook Islands, ceremonial structures falling within the above image of East Polynesian *marae* would encompass only some of those found in Tongareva and Rarotonga. By reviewing all ceremonial structures in the Cook islands, we are immediately plagued with the variety and the complexity of their collective configurations. This is the same impression that Emory (1971: 73) drew attention to in relation to those ceremonial structures in the Hawaiian and the Marquesan Islands. We may have to rethink the whole concept of *marae* in East Polynesia. On this point, Valeri's suggestion about the concept of *heiau* would be noteworthy. He, referring to the literary meaning, points out that the term is "defined by its function, not its material aspect," and thus "the term heiau can sometimes refer to a simple natural object or to an element in a landscape where the god manifests himself and where sacrifices are offered to him" (Valeri 1985: 173). Consideration of ceremonial structures in the Cook Islands, taken together with the situation in those in other island groups, makes it possible to take the view that the group of ceremonial structures in the Society / Tuamotu region, with its 'basic elements,' in fact provides us with just one more region with its own local forms.

5.4.1. Culture Historical Relations of Cook Island Ceremonial Structures

Marae in the Society and the Tuamotu Islands are not, however, without their own morphological variations. Rather, similarities and differences have been examined, and typological classification systems have been proposed in order to explain the development and spread of ceremonial structures especially in the Society Islands (e.g. Emory 1933; Sinoto 1996). Emory (1943, 1970), moreover, tried to establish a scenario for a developmental sequence covering the whole of East Polynesia.

Similar efforts based on a culture historical perspective are continued by some scholars today, although most of them keep in view the use of their results in assessing other aspects of these prehistoric societies such as socio-political changes. For instance, Sinoto (1996) reconstructed a typological sequence of *marae* for the entire Society Islands on the basis of his own extensive data throughout the group and that from Mata'ire'a Hill in Huahine in particular. Wallin (1993), analyzing construction variables of 444 *marae* by statistical methods and using available radiocarbon dates, built a type classification system of *marae* in the Society Islands and proposed a hypothetical chronological sequence of various types. An examination similar to Wallin's work was also applied to ceremonial structures in Easter Island (Martinsson-Wallin 1994). In Hawaii, Kolb (1992) examined 108 *heiau* temples from Maui with available radiocarbon dates from seven sites, and showed the temporal variation in stylistic traits of *heiau*. Graves and Cachola-Abad (1996) used the same data that Kolb did, but also using the seriation method to modify some of Kolb's results [10].

In respect of the Cook Islands as well, some scholars have indicated similarities of the specific ceremonial structures within the island group to those in other islands or other island groups on the basis of a culture historical perspective. To my knowledge, there are quite a few such descriptions and some instances of them are given below.

Tongareva — the Tuamotu Islands (rectangular marae):

There is a considerable affinity between the maraes of the northern Tuamotuan archipelago described by Seurat (1905: 475-484) and those of Tongareva. Both have raised platforms made of limestone slabs, a filling of coral material, and limestone pillars on the back line [see Fig. 3.4.1]. However, the raised platform of Tuamotuan maraes faces an open court that is not clearly defined and not embellished with pillars on the front and sides [Buck 1932a: 178].

Tongareva — Malden in the Line Islands (rectangular marae):

There is some rather interesting evidence that settlers from Tongareva may have reached some of the Line Islands to the north, particularly Malden. Emory's surveys (1934) on Malden Island indicate the existence of slab graves and curbed house floors that are very similar to those on Tongareva. He also illustrates two *marae*, site 1, *marae* B and C (Emory 1934: 28-30), which are extremely close in plan to the Hangarei *marae* (TON-21) on Tongareva [see Fig. 3.1.5]. ... Although Emory thought that the Malden marae reflected influences from Raivavae Island in the Australs (1934: 40), the similarities with Tongareva are just as strong, and Tongareva lies only 650 km to the south, while a trip from Raivavae would be over 2000 km [Bellwood 1978: 178].

Tongareva — Pukapuka in the Northern Cook Islands (circular courtyard):

Only two sites, TON-03 [see Fig. 3.1.2] and TON-17, are circular, although Buck (1932a: 180-182) does describe two other small circles of uprights .... They are, to my knowledge, quite unique in eastern Polynesia .... However oval or circular religious enclosures that are lined by slabs were recorded for Pukapuka by the Beagleholes (1938: 160 - 161) [Bellwood 1978: 178].

Pukapuka — Niutao in the Ellice Islands (circular courtyard):

The pattern of a low-walled, oval or circular religious enclosure with a central stone representation of a god is an unusual development in Polynesia and recalls the structures that Gill described for Niutao in the Ellice Islands which he visited in 1872. ... The religious structure adjoined the burial ground (a common Pukapukan pattern) and consisted of "an oval low enclosure, composed of flat stone, some higher than others, each representing a distinct divinity, so that the sacred men standing inside the enclosure — the people of course outside — could worship all the gods at once" (Gill 1885: 14) [Beaglehole & Beaglehole 1938: 161].

Rarotonga — the Leeward Society Islands (platform):

It is of interest because it is the largest dry stone platform observed on Rarotonga, although any signs of an associated *marae* court no longer survive. ... Apart from its size, the main point of interest concerns the presence of the orthostats. This technique of construction is fairly common in the marae of the Leeward Society Islands, and Emory (1933: 132) illustrates precisely the same technique of facing on marae Manunu at Maeva, Huahine. It may be that the Avana structure was actually constructed by someone with a first-hand knowledge of Leeward Society Island *marae* [Bellwood 1978: 81].

Rarotonga — the Tuamotu Islands (rectangular *marae*):

The site [RAR-104 Vaevae Kiore *marae*, see Fig. 4.1.14] is unique on Rarotonga, and shows considerable similarity to a marae described by Garanger for Rangiroa, Tuamotu Islands (Garanger 1966: plate 1, 1 — marae Pomariorio). ... Pomariorio differs from Vaevae Kiore in having three uprights in the court, but the point remains that Vaevae Kiore does show some rather specific similarities to marae of the western Tuamotuan type. Since it differs from other Rarotongan marae, a Tuamotuan origin is not perhaps unlikely [Bellwood 1978: 86].

Aitutaki — the Leeward Society Islands & New Zealand (*atarau* structures):

Type D3 [see Section 5.3.2]. The main features of *marae* of this group are structures corresponding to the atarau as described by Buck .... It should be noted that cists of this type are structurally closely related to the *ahu* of Leeward Society Island *marae* and also to the New Zealand *tuahu* [Bellwood 1969: 526].

Aitutaki — Mitiaro in the Southern Cook Islands (*atarau* structures):

The D3 *marae* ... is defined as 'a group of structures corresponding to the *atarau* described by Buck' but the *atarau* on some D3 *marae* are rectangular cists of flat upright slabs of which the interior is left empty (Bellwood 1969: 526). Bellwood suggests that these cists are structurally related to the Society Island (or Rarotongan) *ahu* form and cites examples from Emory (1933) in support. The Emory examples, however, do have an infilled interior thus forming a functioning platform although they are lower than the top of the walling (Emory 1933: Plates 16 and 17). ... I suggest these may be a unique Cook Island monumental form which had quite a different function from the *ahu* or *atarau*. This type of structure is also common on Mitiaro and contrasts there with the more standard ahu which are also present [Walter 1996a: 69, see also page 73].

Mangaia — Rurutu in the Austral Islands (*'Are Karioi*):

[In MAN-26 described as 'Are Karioi by the people] A more interesting parallel lies with

'Are Karioi of the prehistoric nucleated settlement at Vitaria, Rurutu, recorded by P. Verin (1969: 113, 120, site Ma 11). At both the Rurutu site and MAN-26 a small *marae* stands in one part of a larger enclosure, and at both sites the larger enclosure was the site of an entertainment house .... A specific association of this kind appears to be unusual, and may not be entirely accidental [Bellwood 1978: 158].

Atiu — the Tuamotu Islands & Tongareva (shouldered uprights):

[Six slabs of a monumental wall at Vairakaia, AT-20] had been recessed on either side on top to produce the effect of a head-like projection. Similar modifications to the tops of vertical slabs have been reported from Tongareva in the Northern Cooks (Hiroa 1932: 155-156, Pl. 5C), and from the islands of Fakahina, Fagatau and Tatakoto of the Tuamotu group (Emory 1943a: 6-8, Pl. 1B and 3A), but in these cases they are marae uprights or "pillars" [Trotter 1974: 109-112].

Atiu — Vavau Group in the Tongan Islands (shouldered uprights):

Shouldered slabs almost exactly like those at Vairakaia [AT-20] also occur in a rectangular wall enclosing a mound at Utungake on Vavau, Tongan Islands (Janet Davidson, personal communication 1971). The present Wesleyan church stands on this mound and McKern (1929: 27-28) was told that the slabs came from the facings of another older mound. McKern (1929: 14) has recorded other "monumental stones" with shaped tops on a nearby site .... [Trotter 1974: 112].

Mitiaro — Rarotonga in the Southern Cook Islands (rectangular *marae*):

A coastal structure [Te Rua Roa *marae* in Mitiaro] similar to the Rarotongan, Type B4, quadrangular pavement with ahu and uprights is also noted [Walter 1996a: 73].

Other than the above descriptions, some new suggestions for possible culture historical relations in respect to the four atolls in the Northern Cook Islands can be derived from the information of recent researches carried out by Keio University. One of them is related to stone arrangements within the *marae* court, which consist of low coral slabs set on edge and show the reversed alphabetic letter "F" or "L". This offers the possibility that these components were originally small rectangular enclosures with an inner partition. More than half of Tongarevan *marae* have inner components (11 sites) and are provided with two such architectural elements at one end of the court (Type B). This alternative is employed instead of a platform which

would be more similar to the *ahu* structure in the Tuamotu and the Society Islands. The same element is also seen in some rectangular *marae* in Manihiki. What is unique in East Polynesia is that such an architectural element is arranged at the position spatially equivalent to that of platform within the court in many other *marae* with *ahu*.

A second widespread innovation in the Northern Cooks is of mounded ovens for ceremonial cooking of turtles, which are heaps of coral boulder and gravel sometimes with a hollow on top. These mounds have been found in Tongareva, Manihiki and Rakahanga. Turtle ceremonies are known from many islands in Polynesia (e.g. Williamson 1924), but it appears that turtles were usually cooked in pit ovens. I suggest that the mounded ovens would be an innovative feature restricted to the East Polynesian speaking Northern Cook Islands, but do not occur in Pukapuka Atoll [11].

The last is of a ceremonial site (PUK-W10) — in Pukapuka. As already described in Section 5.1.2, the site consists of a row of three large uprights standing at the edge of a taro patch and an oval ended house foundation enclosed with curbstones. This combination is quite different from those of any *marae* in East Polynesia. It is in keeping with ceremonial spaces in Futuna (and Alofi), Ellice Island, Tokelau Islands and Tikopia, which would have consisted of some uprights and houses of high-ranking chiefs or major gods (see Green 1970). While it is unclear whether the foundation in site PUK-W10 was that of a chief's house, a god house or a watch house, the architectural elements and their combination suggest the culture historical relations of Pukapuka, like its language to be with West Polynesia. Seen in this light, it may be also that Mua Marae in Rakahanga (RAK-2) which is an open court with a large upright standing at the center was affected by the West Polynesian pattern of ceremonial spaces, although we could not identified any traces of house structures during the 1990 expedition (see Fig. 5.1.6).

5.4.2. Limitation of Culture Historical Approach Encompassing the Entire Cook Islands

As outlined above, there are an abundance of descriptions indicating culture historical relations both within the Cook Islands and of some islands in this group with other islands in Polynesia. Few among them are, however, the results of systematic on statistically motivated comparisons of architectural elements, nor do they propose models of diachronic and spatial variability showing the development of ceremonial architecture in the Cook Islands. This is in marked contrast to some recent studies in the Society and the Hawaiian Islands. For all that, this does not mean that the rather low level of interpretation is solely due to any lack of interest in the topic. Instead, the less advanced state of culture historical studies in the Cook Island ceremonial structures is almost certainly partially due to the poor preservation of religious sites, and accurate records from them. But it is mainly due to the marked diversity of architectural elements and their collective configurations. The culture-historical comparative path has not proven as productive for good reason.

Scholars who take an interest in culture historical relations may be bewildered by this all too evident diversity in *marae* forms, since it appears that there is no neat classification system capable of encompassing the entire Cook Islands, much less Eastern Polynesia. One possible way would be to take a polythetic view of ceremonial sites and their elements. In this approach, a site need not be classified according to any one or a cluster of fixed criteria. Each assemblage is defined instead by various architectural elements including those unique to a given geographic boundary such as a valley, island or island group (see Adams & Adams 1991: 69-70, 355). Still in our present state of knowledge, even this approach does not appear to be fully warranted.

5.5. Studies of Locality Leading to Interpretation of Ceremonial Structures in the Cook Islands

Ceremonial structures in the Cook Islands appear to be quite diverse in comparison to those of other island groups, such as the Society and Tuamotuan region. Thus, it is difficult to classify them all systematically. This is entirely compatible with the notion of the Cook Islands. Since the Cook Islands is not in any sense a cultural area but a modern political division formed in AD 1901, it may be a matter of course that we can not construct a classification system applicable to all ceremonial structures in the island group, and should not try. This is, however, the case even in geographically smaller areas such as the Northern Cooks, the Southern Cooks, and probably Ngaputoru as well. Moreover, we encounter it even on an island such as Rarotonga. In short, the diversity of ceremonial structures currently appears to prevent us from establishing any systematic classification relevant to some kind of developmental sequence, even at a regional level [12].

It has been said that ceremonial structures are "subject to such processes as retention, rejection, diffusion and independent development" (Bellwood 1970: 102). In the case of the Cook Islands, these processes would seem to have been so complicated as to give rise to the marked diversity of ceremonial structures, and thus we need to scrutinize local conditions within a far more restricted area in order to comprehend them profitably.

5.5.1. The Northern Cook Islands as an Interface between West and East Polynesia

The Northern Cook Islands provides a suitable case in which to examine an entwinement of the above processes that might have produced the diversity of its ceremonial structures. The four atolls in this group, together with the Tokelau and the Ellice Islands, have been discussed as the

"intermediate" area between the West and the East Polynesia in studies of distribution of cultural traits (e.g. Burrows 1940; Vayda 1968). There are two reasons for this. One is that these atolls are located between Samoa and the Society Islands (Fig. 5.5.1). Another reason is that the populations in these atolls were so small and easily fluctuated during natural disasters that cultural impacts of newcomers from both the west and the east would have been larger than those on other volcanic high islands (Vayda 1968: 199-201).

In a tabulation which Burrows has made, certainly, the four atolls in the Northern Cook Islands represent a more equal distribution of western and eastern traits than in the high islands such as in the Southern Cook Islands. In respect of the ceremonial architecture, both traits can be also seen in this island group. Moreover, the distribution of these traits is not equal in each atoll, but shows a sort of cultural cline tending geographically from one end to the other. In Pukapuka, the westernmost atoll, there remain western traits such as an open court, a house foundation and some marked uprights. In contrast to this, eastern traits such as a rectangular court and a platform are seen in Tongareva, the easternmost atoll. And in Manihiki and Rakahanga which are located between the two atolls above, there is evidence for traits in ceremonial structures stemming from both directions.

From one viewpoint, the Northern Cook Islands seems a likely region where the influences from West and East Polynesia interfaced with each other in respect of ceremonial architecture. How could such a situation come about in this cluster of islands? One factor, as already described, lies in a location that it is between Samoa and the Society Islands, but there would have been another factor, which is related to the time lag of colonization periods in the Northern Cook Islands.

While all the islands are atolls formed by the same geological process, there would have been the local difference in relation to the timing of Holocene coral emergence — from 5270 - 5031 Cal. yr. BP in Pukapuka (WK-4525) to 1866 - 1685 Cal. yr. BP in Tongareva (N-5654). This difference, taken

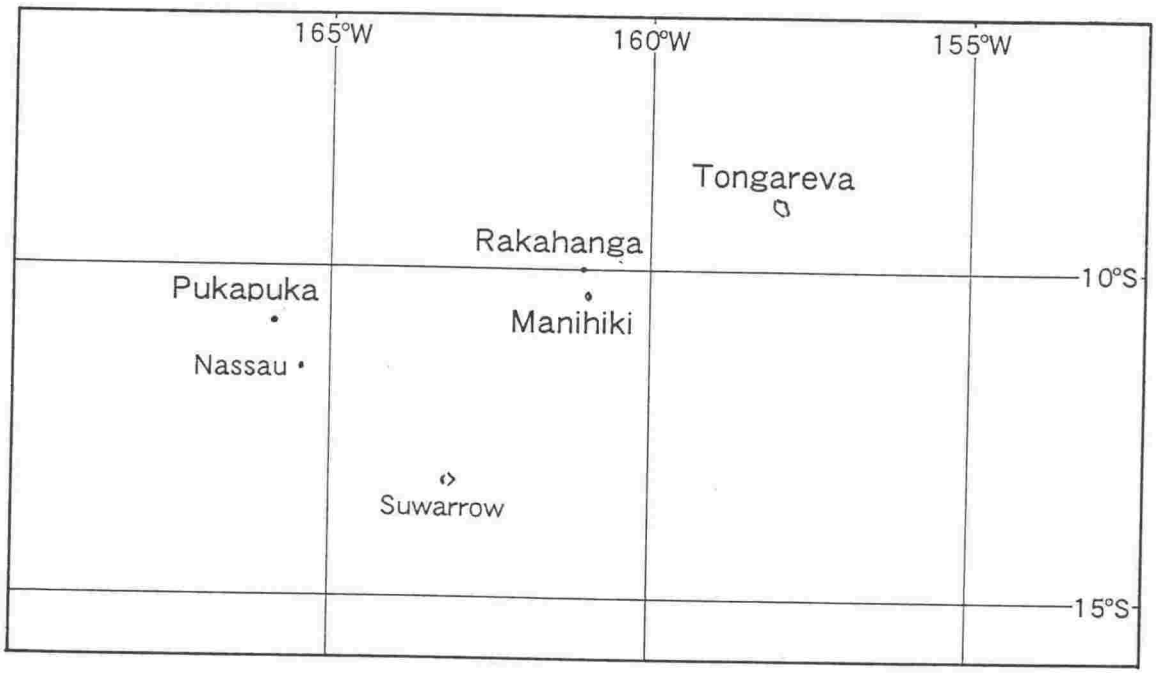

Fig. 5.5.1. Map of the Northern Cook Islands

In respect of ceremonial structures, both traits from the west and the east can be seen in the Northern Cook Islands. At one view, the Northern Cook Islands seems the forefront where the influences from West and East Polynesia coped with each other

together with differences in the speed of growth of the sub-aerial landform and in rainfall, has in a sense effected the colonization period of each atoll within the 'continuous model' of Polynesian migration history. Some archaeologists, for example, have recently indicated that the advance eastward went on beyond Tonga and Samoa without any marked long pause (Bellwood 1970; Davidson 1976; Irwin 1981, 1992, 1998; Kirch & Hunt 1988). If so, cultural traits from West Polynesia would have become established during the early period on Pukapuka, and probably Manihiki and Rakahanga. But it is not the case with Tongareva, because it would not yet have become available for settlement in more than 2000 years ago. This atoll is rather supposed to have been colonized in the later period from the east. This possibility is supported by the marked difference in earliest dates of human occupation between Pukapuka and Tongareva — it reaches more than 1000 years (see the details discussed in the Chapter 2).

While we have some radiocarbon ages concerning the construction period of ceremonial structures, it is not sure at present how far the cultural traits comprising them go back to the past. The possibility should not, however, be discounted that the duration of cultural influence from West Polynesia is related to retention, rejection, diffusion and independent development of ceremonial structures in each atoll. Rather, a consideration of such local circumstances, along with the location of each atoll in Polynesia, would comprise part of a "thick description" serving to comprehend the diversity of ceremonial structures in the Northern Cook Islands.

5.5.2. Theoretical Implications of Three Case Studies to Studies of Locality

The evidence from Pukapuka indicates that the colonization of Central Polynesia had started as early as at least AD 100 - 400. Similarly, several scholars have recently advocated that the Southern Cook Islands would have been already colonized from the west at a period comparable to that for Pukapuka (e.g. Kirch & Ellison 1994). At any rate, most islands in this group would have been certainly settled by at least AD 800 - 1200 (see Section 2.3). Moreover, the pattern of importation of exotic materials recently discovered indicates the likelihood that islands in this group would have been linked by a voyaging network established at the time of initial settlement and lasting up to about 14th century AD or perhaps 15th century AD. During the time of inter-island contacts, equivalent to the phase of 'Archaic East Polynesia Culture' which "may have been part of a wider Polynesian interaction sphere" (Walter 1996b: 522), various architectural elements (and thus various meanings) would have flowed into the Cook Islands both from the west and the east, as indicated in the discussion of the Northern Cook Islands above [13]. Of interest is that the frequency of inter-island voyaging appears to have come to decline some time after the 14th century AD (Walter 1994: 228). If it is correct, such a situation would have precipitated the subsequent diversification and localization of Cook Island ceremonial structures in the

course of the last millennium.

Because of such a complex cultural sequence, it may not be easy to identify definite cultural relations and developmental sequences of ceremonial structures in each island of the Cooks, although some specific descriptions are possible. This does not, however, imply that we have little more to do in relation to these ceremonial structures. They are certainly susceptible to studies seeking to address socio-cultural issues and the meanings encoded in any physical religious form, since admittedly each ceremonial structure should be related to cosmological, political, social and economic factors as well as to culture historical ones (e.g. Bellwood 1970: 100). In this kind of inquiry any patterns of similarities and differences in various archaeological data must be analyzed including those concerning location (such as topographic elements and vegetation types) and direction as well as morphology. They, taken together with ethnographic information, would provide relevant contexts from which to interpret aspects of meaning.

There would be at least two ways to address such meanings. One of them, as indicated by a case study of Tongareva Atoll (Chapter 3), is an investigation of the content of various meanings encoded in each structure. Basically, such a study must be done heuristically, through trial and error, according to Hodder (1986: 135) or through a dialectical process of question and answer to close the hermeneutic circle (Hodder 1991: 7-8). There would be therefore no strict analytical formula which can be applied everywhere. Archaeologists working in Polynesia, however, can make use of an analytical instrument derived from settlement pattern studies, which provides relevant scales or levels for analysis — household level (micro level), community level (or semi-micro level) and the political level (or macro level) (Green 1984, 1993).

In the analyses of Tongarevan *marae*, I established three analytical levels — those of households, districts and inter-districts — on the basis of archaeological data of other sites (dwelling house, cooking houses, graves,

wells and so forth) and ethnographic accounts of socio-political organization, and then approached different meanings at each level (see also the summary of Chapter 3). As a result, it became clear that Tongarevan *marae* were richly polysemic. Each *marae* would have been constructed with a set of various meanings including economic, social, political and cosmological ones.

Of interest is that every *marae* does not necessarily share the same set of meanings. As their morphological homogeneity suggests, many similar meanings appear to be encoded in most *marae*, while it is also certain that there are meanings unique to a particular *marae* or a cluster of *marae*, which are, at least at times, related to the variations of physical characteristics — including elements accompanying their location. This line of inquiry suggested that Tongarevan *marae* served as nodes which associated groupings of people with various socio-political levels ranging from households to the entire atoll.

The second way to address meanings encoded in ceremonial structures is to delve into the main significance of ceremonial architecture which seems to be peculiar to each island, as indicated by case studies of Rarotonga and Mangaia (Chapter 4). Such a study does not lead one into the detail contents of various meanings, but instead turns the attention to the question of whether ceremonial structures in each island show a pattern of homogeneity or heterogeneity. Such a line of inquiry will, in a sense, produce a common basis for comparisons among islands.

In this framework, the comparison among the three islands — Tongareva, Rarotonga and Mangaia — is intriguing. Tongareva was a segmentary society in which several districts possessed considerable autonomy and were self-sustaining. In that case, the *marae* exhibit a homogeneity in their collective configuration, location and direction. The organization of Rarotongan *tapere* — basic land divisions occupied by lineages — also presented features of segmentary society, although they were in turn politically integrated into one of three *vaka* — territorial tribes. Yet the Rarotongan *marae* show the

Table 5.5.1. Relations among pattern of society, pattern of *marae*, and their significance of main role

Island	Pattern of society	Pattern of *marae*	Significance of main role
Tongareva	segmentary	homogeneous	territorial markers of districts
Rarotonga	segmentary	heterogeneous	expressions of cosmology ?
Mangaia	integrated	homogeneous	legitimization of authority

remarkable heterogeneity in their collective configuration and location. Finally, Mangaia can be viewed as one of the most integrated societies in the Cook Islands, and the *marae* shows the marked homogeneity in their collective configuration and location. Table 5.5.1 schematically shows the relationships that seem to have held among the pattern of a society, the pattern of its *marae* and the main significance of their role in each of three islands.

From this table, it becomes clear that the patterns of *marae* do not necessarily correspond to the social patterns within these three societies. In both a segmentary and an integrated societies, *marae* can take on a homogeneous pattern, but there is also the case that *marae* in another segmentary society can exhibit a heterogeneous pattern. Thus, it seems that the pattern of *marae* — homogeneity and heterogeneity — are in large part dependent on the local context in relation to the main significance of their roles in that society. A main function of Tongarevan *marae* is that they are supposed to have expressed the territoriality or ownership of districts to particular properties. If so, each *marae* should have shared common characteristics in order to show that they were sacred *marae* (see Section 3.3). In the case of Mangaian *marae*, the homogeneity may have to be interpreted in the local context of highly institutionalized dual political system which was entwined with control of irrigated wet taro fields (see Section 4.2). The

heterogeneity of Rarotongan *marae* — which are supposed to have belonged to each *tapere* — may have to be comprehended in the variety of sacred or ceremonial spaces (see Section 4.1), and any significance similar to that of Tongarevan and Mangaian *marae* would only be found in other architectural features such as T-shaped *paepae* and *koutu*.

Above, only three islands were discussed in relation to patterns of homogeneity and heterogeneity represented by *marae*. If the cases of other integrated societies such as the Society Islands — where *marae* of different types are argued to have co-existed in late prehistory (Green et al. 1967: 162) — are added to Table 5.5.1, the importance of local contexts will be clearer, and thus the result of comparisons among islands will provide a warning to facile generalizations concerning relations between socio-political systems and ceremonial structures. The details, however, remain a matter of future investigation.

In short, the main aim of this thesis is to advocate the importance of local meanings of *marae*. The locality is, however, relative, and so it can spatially range from the household level through the island level, to the regions and thence to entire East Polynesia culture area, following the nature of meanings to be studied at each level. Relevant contexts to interpretation of meanings with each level must comprise the pattern of similarities and differences in various data including archaeological, environmental and ethnographic ones. The studies of locality are therefore expected to elucidate not only common meanings in East Polynesia ceremonial structures, but also those peculiar to small areas — and the latter appears to hold more promise and to constrain those culture historical or processual approaches which aim at uncalled-for generalization.

Notes to Chapter 5

(p. 189) [1] Referring to the ethnographic information of a ceremony which was recorded by Lamont (1867: 121-2), however, it is evident that uprights standing along sides of court also served as position markers of some crucial members joining ceremonies — including young men who frightened away the evil spirits from the *marae* by their spears. The scene figured from Lamont's information appears to be in keeping with the reconstructed scene of a ceremony of turtle offering performed at a *marae* in Napuka Atoll, the Tuamotu Islands, in which elders with spear clubs are seated along both sides of the court (Emory 1947: Fig. 1).

(p. 195) [2] An anthropometrical study also support the affinity between two atolls (Shapiro & Buck 1936: 16).

(p. 195) [3] This islet (Te Kainga) is told to have been "the original home of the people" (Buck 1932b: 5). The present village on the main islet south of Te Kainga seems to have been formed after the arrival of Christianity, according to a modern folk tale of "Maretu (a London Missionary pastor) and the sea urchins" (Kauraka 1983: 57).

(p. 200) [4] The term of *malae* was also used to represent the meeting place of the old men (*tupele*) where bonito caught were all brought, to be divided among the people of the atoll (Beaglehole & Beaglehole 1938: 67).

(p. 200) [5] The term of "*potu*" was also used to express sacred seats in god houses. These seats "consisted of coral slabs placed on edge to form indifferently a round or square curbing about 9 inches high; the interior of this curbing was filled with fine gravel to form a low seat about 16 inches wide" (Beaglehole & Beaglehole 1938: 318). Macgregor — in a short visit to Pukapuka in 1933 — reported that two stone structures had existed "on either side of the bend of the southeastern coast of Motu Koe [Motu Ko] Islet" (Macgregor 1935: 24-25). Taking into account the second meaning of *potu*, it seems likely that these structures were also simple shrines. Of interest is that Macgregor inferred that these seats had been used as offering places of turtle and fish to gods, in the same way of the *potu* of Leweke (the god of clams) which was described as one of simple shrine by Beaglehole & Beaglehole (1938: 318).

(p. 201) [6] The land behind Mata Ala — called Motu Uta — is the reserve land of Roto Village, and main food resources such as wet taro and coconut trees are cultivated there. The land is divided into eight sections (*kawa*), each of which is controlled by one of eight paternal sub-lineages (*wakavae*) or eight groups sharing food resources (*tuanga*) (Chikamori 1989). Mata Ala serves as an

important node of the sectioning of *kawa*, and thus it is also likely that this site bears a symbolic meaning which is related to the socio-political system and the land tenure within Roto Village.

(p. 204) [7] AIT-34 and AIT-35 *marae* which were classified into Type D1 by Bellwood (1978), appear to have an alignment of uprights and a single upright standing apart from the alignment. These characteristics are typical to D2 marae according to Bellwood's descriptions. AIT-37 *marae* which was classified into Type D3 consists of two parts. One of them is probably a damaged *atarau*, as Bellwood proposed, and another one is formed with some taller uprights which appear to be arranged in a line, on the basis of his diagram (Bellwood 1978: Fig. 63a). If so, this marae should be classified into Type D4.

(p. 204) [8] Seen in this light, it is conceivable that AIT-1 *marae* — which was classified as Type D3 —originally had the alignment(s) of uprights before the period of European contact and their removal.

(p. 207) [9] It is likely that the political unit of Ngaputoru was formed with a suzerain island (Atiu) and two tributary islands (Ma'uke and Mitiaro) (Duff 1974: 93-4). The system of land tenure and chieftainship centered on Atiu but was structurally common within Ngaputoru (Williams 1837: 43).

(p. 212) [10] This work of Graves and Cachola-Abad (1996) would be among the most successful of these recent studies of ceremonial structures. Their work shows that while having an important role in traditional culture history, the seriation method may also produce fruitful results beyond the culture historical aspect. Thus, it theoretically could be successfully applied to regions already provided with systematically collected data on ceremonial structures such as the Society Islands, as the authors point out.

(p. 216) [11] We did not discover similar mounds in Pukapuka during our expedition in 1995. Instead, we retrieved many fragments of turtle plastron from some excavated habitation sites. According to a Beagleholes' description, all turtles taken to the meeting place of the old man and there the meat, fat, eggs, and shell were divided among the all member of the community including women and children (Beaglehole & Beaglehole 1938: 70). This information is in a marked contrast to that of Tongareva. In Tongareva, the people removed the sacredness from captured turtle and cooked them through formalized ceremonies, and then only male members (probably of high ranks) could eat the flesh (Lamont 1867: 182-183). Both archaeological and ethnographic contexts suggest that the ideological meaning imposed on turtle was different between Pukapuka and other atolls in the Northern Cook Islands.

(p. 218) [12] Yet, in Section 4.1.7, I proposed a classification of Rarotongan *marae* (see Fig. 4.2.15). While each type encompassed a few cases often less than three, it might be useful to reconstruct a developmental sequence if radiocarbon dates from some sites become available (some charcoal samples are now in analysis).

(p. 221) [13] The earliest calibrated radiocarbon age of *marae* in the Society Islands falls into the range between 1450 AD and 1630 AD (Garanger 1969; see also Wallin 1993: 68). The age appears to be somewhat later than the cultural phase of inter-island contacts. The age is, however, derived from a well-formalized *marae* in Tautira District, Tahiti Island, and thus it is easily conceivable that the appearance of simpler form goes back to the period as early as the inter-island contact phase in East Polynesia.

Chapter 6

Cook Island *Marae* in Comparative and Local Perspective: a Summary

In Geertz's phrase, *marae* or ceremonial structures in East Polynesia are "richly polysemic (that is, have multiple senses), their significance spreading out profusely in an embarrassment of directions" (Geertz 1980: 103). This would certainly be supported by ethnographic descriptions of their function which suggest that *marae* were intimately related to various aspects of prehistoric societies including economic, social and political as well as ideological and cosmological realms. It is, however, fair to say that archaeologists have hardly attempted to approach the great variety of the meanings that are encoded in *marae*. Culture historical studies certainly examined various traits of *marae* as representing cultural norms, but were less concerned with socio-cultural roles or meanings in themselves. Most processual studies associated *marae* with chiefly hegemony and dominance within an evolutionary viewpoint, but still tended to avoid other meanings symbolized by *marae*. In either perspective, *marae* tended to be studied for limited purposes or to be lodged among descriptive studies as one of important data but with little interpretation. The products of these studies should not be discounted, but it would be also useful to ask what are the roles of *marae* in each island or to look the various aspects of a prehistoric society through *marae*. It is from this viewpoint that ceremonial structures in the Cook Islands were scrutinized in this study.

In developing a conceptual framework for the analysis of *marae*, the history of *marae* studies in East Polynesia was firstly discussed in three sections: a culture historical, a processual, and a structural perspective. Most previous studies have overly constrained inquiring into the local characteristics of ceremonial structures in order to reconstruct culture historical relations in East Polynesia, or to build general model of social

evolution which would be applicable to some of the stratified societies of the region. While some structural studies have approached local meanings, they appear not to have been sufficiently detailed to show the polysemy of *marae* in each island. Instead, they have taken a geographically broader focus. A critical reconsideration of these insights provides a new perspective derived from contextual archaeology, in which the main aim is to interpret a variety of local meanings encoded in ceremonial structures of a particular island such as Tongareva Atoll in the Northern Cook Islands.

In this review, it was also proposed that the application of spatial levels of settlement pattern approach serves as an analytical instrument to examine various characteristics of ceremonial structures. Basically, such an examination must be done heuristically through a dialectical process of question and answer. Polynesian archaeology, however, can make use of the spatial levels developed in Oceanic settlement pattern studies: micro or household, semi-micro or community, and macro or the political level. These levels would be useful scales to search relevant contexts through which to read off meanings, and thus to elude two risks: interpreting more things than is really there, and reducing particular meaning to a set of only very general explanations.

Next, I provided the information on environmental settings of Tongareva Atoll, and on atoll formation and human colonization in the Northern Cook Islands. The latter may be thought to be supplementary to the main aim of this thesis. However, it proves to be relevant information when considering the diversity of ceremonial structures in the Northern Cook Islands. This point is further elaborated in Chapter 5.

Drawing on the theoretical framework and analytical procedures developing in the opening chapter, Tongarevan rectangular *marae* (23 sites) were examined as the main case study. The object was to extract a variety of meanings encoded in ceremonial structures, following the description of their architectural features. With the descriptions in hand, the spatial separation

of *marae* from dwelling spaces was discussed, and three possible meanings — economic, social and ideological — were proposed, each of which proves to be interrelated with the other. Thus, two roles of *marae* as symbols of districts and as lesser territorial markers are discussed by examining the relation of *marae* sites with districts and of various locations within territories of districts. In particular, the first role was shown to be related to the context of socio-political bonds of households, social units which were economically self-sufficient within districts. The second role was played out in the context of self-regitimation of districts within a segmentary society. At level of individual *marae*, it was shown that the distribution pattern for interior component types — platform and stone arrangement type — was in fact also associated with aspects of the political alliance among districts. Finally the possibility that the prevailing orientation of most *marae* was probably related to the sacredness of ocean was examined.

From these discussions it became clear that Tongarevan *marae* were richly polysemic. Each *marae* was constructed with various meanings including economic, social, political and ideological ones. It is also important to understand that every *marae* does not necessarily share the same set of meanings. In fact there are meanings unique to a small number of *marae*. This reflects a situation in which *marae* would be one of most important architectural features within a community and therefore serve as nodes which associated the people with various socio-political levels ranging from households to the entire atoll.

The perspective developed in the analysis of the Tongarevan case was expanded by an analysis of the location and morphology (including collective configuration) of ceremonial structures both in Rarotonga and Mangaia as two additional case studies. Again the observed pattern proved to be different in each of these islands and varied with the local context of socio-political organization. In the case of Rarotonga, *marae* show a heterogeneous pattern both in location and morphology. It seems thus must not be interpreted solely by the *vaka* system which unified several *tapere* (basic land divisions) into a

larger political unit and was related to *'Ara Metua* (the ancient roadway traversing *tapere*), but by the socio-political features of *tapere* themselves which enjoyed a great measure of independence as far as their territories were concerned. Thus, the variety of topographic features in *tapere* territories, ranging from the mountainous inland to the ocean, have to considered in order to properly interpret the diversity of *marae* observed within a *tapere* territory.

In the case of Mangaia, the *marae* structures exhibit a greater degree of uniformity both in location and morphology. This pattern is in striking contrast with that observed in Rarotonga. All Mangaian *marae* except one site are distributed close to irrigated taro fields. Such an uniformity of location was interpreted through the meaning of irrigated fields as the spatial node serving to unify a three way linkage among economic, political and ceremonial activities. The morphological homogeneity was also interpreted as part of an institutionalized political system in which tribes were prevented from overly stressing their uniqueness, their cohesion being symbolized in the uniformity of their *marae*.

Once the individual case studies were in hand, a review was undertaken of ceremonial structures — especially their morphological characteristics — for the entire Cook Islands. In overview, while some common characteristics such as uprights are certainly discernible in many of them, their collective configurations are not at all homogeneous. In fact, the diversity is quite sufficient to cause a revision of the prevailing image of East Polynesian ceremonial structures that they all share basic morphological elements. Rather, the group of ceremonial structures provided with all these supposed basic elements, turned out to just a set of regional forms distributed mainly in the Society and the Tuamotu Islands.

Morphological similarities were also examined in this overview through enumerating descriptions of *marae* and their typology by other scholars and presenting new evidence on four atolls in the Northern Cook Islands. By

teasing out a set of comparative statements about the ceremonial structures throughout the Cook Islands, we find there is a lot of evidence implying culture historical relationships not only within the Cook Islands but also beyond that island group. In particular, in the Northern Cook Islands influences were discernible both from West and East Polynesia, and a cultural cline in them occurs from Pukapuka (the westernmost atoll) to Tongareva (the easternmost atoll) as well. In respect to this topic, it was supposed that the differences in the period of colonization for each of the four atolls seems to be one of important factors in this situation, and example which shows that history matters.

An important outcome of this study is that ceremonial structures in the Cook Islands are so diverse that it is difficult to classify them in any overall systematic fashion. Thus, the only possible way to treat *marae* would be as a polythetic category. Various processes such as retention, rejection, diffusion and independent development have each been so complicated that we are prevented from developing further typological culture historical studies of ceremonial structures for the entire island group. It is not true, however, that there is nothing to do. Rather, *marae* are susceptible of study to extract local meanings encoded in them in accordance with the perspective of contextual archaeology. It proves to be the case, if we treat these matters island by island, focussing closely on the implications of each of three island case studies, that one can develop a contextual approach to *marae*. Each emphasizes not generalization or synthesis, but studies of locality or small regions. I believe this may prove to be one of the more effectual approaches to comprehending the polysemic characteristics of ceremonial structures in East Polynesia.

Such an approach, moreover, does not necessarily exclude the more usual comparison among islands, since the locality is relative. Thus, geographic extent can be extended to an area encompassing several islands and probably even to the entire core area of central East Polynesia. From this point of view, it was possible to show in the last part of Chapter 5 that the homogeneous or

heterogeneous pattern observed in morphology and location of ceremonial structures could be related to the main socio-cultural features in each island, as derived from the local context. Those relationships hold for the comparison among three cases of Tongareva, Rarotonga and Mangaia. Such comparisons also suggest again the necessity to realize interpretations along the line of their local meanings before linking too facilely ceremonial structures with various degrees of complexity thought to have occurred among strongly ranked societies.

Some archaeologists working in Oceania, by continuing to develop settlement pattern archaeology, have recently advocated a new perspective which Green (1993) now calls 'landscape archaeology' (cf. Weisler & Kirch 1985, Kirch 1989). This attempts to approach four aspects: environmental, social, economic and ideological (or cosmological). Such a trend toward more pluralistic settlement pattern studies would meet with the analysis of richly polysemic ceremonial structures advocated here. Still the importance of local contexts is not stated positively in the advocacy of landscape approach. The term of 'landscape' or 'cultural landscape' has been used since the early 1900s by cultural geographers, who have viewed it as a culturally bounded construct. In other words, landscape is a local phenomenon, and thus can not be comprehended through the more usual cross-cultural analysis. *Marae* are one of the main architectural features within a local landscape along with the variety of cultural constructions, topographic elements, vegetation types and so on. Thus, the contextual approach of *marae* studies provides us an useful starting point to progress further the study of landscape archaeology in East Polynesia.

—Appendise—

Appendix 1: Archaeological Site-Database in the Cook Islands

Tongareva---------- 236

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Aitutaki---------- 269

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Appendix 2: Radiocarbon dates from the Northern Cook and Rarotonga

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Pukapuka---------- 292

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Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-01	ceremonial	mounded oven, unidentified marae		Motu Unga	49, 58, 195		3.3.1, 3.3.2	Bellwood (1978), Buck (1932a)
TON-02	ceremonial	rectangular marae	Tokerau	Tokerau	100	3.3.8	3.3.2	Buck (1932a), Yamaguchi (1995)
TON-03	ceremonial	circular court, mounded oven		Niu-te-kainga	48, 49, 56, 58, 60, 118, 213	3.1.2	3.1.1	Bellwood (1978), Yamaguchi (1995)
TON-04	ceremonial	rectangular marae	Te Tohi	Ruahara	72, 73, 100	3.3.7	3.3.2	Buck (1932a), Yamaguchi (1995)
TON-05	ceremonial	unidentified marae	Sivalau	Ruahara				Buck (1932a)
TON-06	ceremonial	rectangular marae	Te Hara Taurekareka	Rukutia			3.3.2	Buck (1932a)
TON-07	ceremonial	rectangular marae	Arafura	Vaiseru	108		3.3.2	Buck (1932a), Yamaguchi (1995)
TON-08	ceremonial	unidentified marae	Papaki-reia	Tautua			3.3.2	Buck (1932a)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-09/I	ceremonial	non-rectangular court		Kavea	48, 70			Bellwood (1978), Yamaguchi (1995)
TON-09/II	ceremonial	rectangular marae		Kavea	74, 96, 98	3.2.6	3.3.2	Bellwood (1978), Yamaguchi (1995)
TON-10/I	ceremonial	rectangular marae	Mahue	Naue	72, 96, 98, 100	3.2.7, 3.3.8	3.3.2	Buck (1932a), Yamaguchi (1995)
TON-10/II	ceremonial	circular court		Naue	48, 70			Buck (1932a)
TON-11	ceremonial	rectangular marae	Rauhara	Naue	72, 100		3.3.2	Buck (1932a), Yamaguchi (1995)
TON-12	ceremonial	rectangular marae	Hoenga-waka	Tepetepe			3.3.2	Buck (1932a), Yamaguchi (1995)
TON-13	burial	graveyard	Te Puka-nui	Tepuka				Buck (1932a)
TON-14	ceremonial	unidentified marae	Punaruku	Tepuka	124			Buck (1932a)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-15/I	ceremonial	rectangular marae	Te Rupe Tangi Rekareka	Atutahi	96, 98		3.3.2	Buck (1932a), Yamaguchi (1995)
TON-15/II	ceremonial	oval court		Atutahi	48, 70			Buck (1932a)
TON-16/I	ceremonial	rectangular marae	Nukurea	Vaiari	103		3.3.2	Buck (1932a)
TON-16/II	ceremonial	rectangular marae		Vaiari	103		3.3.2	Bellwood (1978)
TON-16/III	ceremonial	rectangular marae		Vaiari	103		3.3.2	Bellwood (1978)
TON-17	ceremonial	oval court		Hakasusa	48, 93, 213		3.3.2	Buck (1932a), Bellwood (1978)
TON-18	burial	graveyard	Hakataungari	Hakasusa				Buck (1932a)
TON-19	ceremonial	rectangular marae	Rakahanga or Awanui	Mangarongaro	54, 66, 69, 74, 93	3.2.2	3.1.1, 3.3.2	Buck (1932a), Yamaguchi (1995)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-20/I	ceremonial	rectangular marae	Te Vete	Mangarongaro	124			Buck (1932a)
TON-20/II	ceremonial	rectangular marae	Te Vete ?	Mangarongaro	74, 75, 124		3.3.2	Bellwood (1932)
TON-21	ceremonial	rectangular marae	Hangarei	Hangarei	49, 54, 56, 58, 60, 69, 74, 93, 99, 103, 108, 124, 127, 213	3.1.5, 3.3.9	2.2.1, 3.1.1, 3.3.2	Buck (1932a), Yamaguchi (in PhD)
TON-22	ceremonial	rectangular marae	Te Reinga	Motu-ko-hiti	98		3.3.2	Buck (1932a), Yamaguchi (1995)
TON-23	ceremonial	monument	Te Papa-o-sokoau	Motu-ko-hiti	51, 60, 89, 98	3.3.4	3.3.2	Buck (1932a), Bellwood (1978), Yamaguchi (1995)
TON-24	ceremonial	unidentified marae	Omoka	Omoka				Buck (1932a)
TON-25	ceremonial	rectangular marae	Saeha	Omoka	77, 103		3.3.2	Bellwood (1978)
TON-26	dwelling	house foundations		Mangarongaro				Bellwood (1978)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-27	dwelling	house foundations		Mangarongaro	102, 124		3.3.2	Bellwood (1978)
TON-28/I	ceremonial	rectangular marae		Mangarongaro	54, 70, 74, 75, 96, 98, 108	3.2.4	3.1.1, 3.3.2	Bellwood (1978)
TON-28/II	ceremonial	circular court ?		Mangarongaro	48, 70, 96, 98	3.2.4		Bellwood (1978), Yamaguchi (in PhD)
TON-28/III	settlement	house foundations		Mangarongaro	67, 68, 70, 75, 96, 98	3.2.4		Bellwood (1978), Yamaguchi (in PhD)
TON-29	ceremonial	rectangular marae		Hakasusa	51, 98		3.1.1, 3.3.2	Bellwood (1978)
TON-30	dwelling	house foundations		Tepetepe				Bellwood (1978)
TON-31	dwelling	house foundations		Te Kasi				Bellwood (1978)
TON-32	burial	large grave		Vaiseru				Yamaguchi (1995)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-33	ceremonial	rectangular marae, large graves	Te Vao ?	Tepuka	54, 59, 74, 98, 108, 124	3.1.4	3.1.1, 3.3.2	Yamaguchi (1995)
TON-34	burial	large grave ?		Tepuka				Yamaguchi (1995)
TON-35	subsistence	fishpond	Angiangi	Tepuka	51, 59, 60, 102		3.1.1	Yamaguchi (1995)
TON-36	burial	graveyard	Hinau	Tepuka	59	3.1.3	2.2.1, 3.1.1	Yamaguchi (1995)
TON-37	ceremonial	rectangular marae		Motu-o-saki	91, 93, 99, 103	3.3.9	3.3.2	Yamaguchi (1995)
TON-38	burial	graveyard	Tongariro	Hakasusa	93		3.3.2	Yamaguchi (1995)
TON-39	burial	large grave		Motu-ko-hiti				Yamaguchi (1995)
TON-40	habitation	excavation		Tautua	75		2.2.1	Yamaguchi (1995)

Archaeological sites in TONGAREVA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
TON-41	habitation	excavation		Tepuka	75			Yamaguchi (1995)
TON-42	burial	graveyard		Motu-ko-hiti				Buck (1932a) Yamaguchi (1995)
TON-43	burial	large grave		Mangarongaro				Buck (1932a) Yamaguchi (1995)
TON-44	burial	large grave		?				Buck (1932a) Yamaguchi (1995)
TON-45	settlement	house foundations, mounds of heating materials		Mangarongaro	64, 66, 67, 69	3.2.2, 3.2.3		Yamaguchi (in PhD)
TON-46	ceremonial	rectangular marae		Mangarongaro	66, 69, 93, 123, 126	3.2.2, 3.3.5	3.3.2	Yamaguchi (in PhD)
TON-47	settlement	house foundations, mounded oven, graves		Hangarei	49, 58, 69	3.1.6	2.2.1, 3.1.1	Yamaguchi (in PhD)

Archaeological sites in MANIHIKI and RAKAHANGA (atolls)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MNH-1	ceremonial	mounded oven, mound of heating materials, graves	Koronui	Ngake	195			Yamaguchi (1998)
MNH-2	ceremonial	mounded oven, mounds of heating materials, paved path, well	Maramanui	Ngake	195	5.1.4		Yamaguchi (1998)
MNH-3	ceremonial	rectangular enclosure with an stone arrangement and a mound of coral blocks, paved path	Ngarikura	Ngake				Yamaguchi (1998)
MNH-4	settlement ?	curbstone lines probably showing dwelling spaces, graves	Vaitaria	Ngake	190, 193	5.1.2		Yamaguchi (1998)
MNH-5	ceremonial	raised platform (probably house platform), stone arrangement, with excavation	Kaitara	Motu Hakamaru				Yamaguchi (1998)
MNH-6	ceremonial	rectangular enclosure, raised platform (probably house platform), paved path	Fua-i-ke-rangi	Motu Hakamaru	193	5.1.3		Yamaguchi (1998)
MNH-7	ceremonial + settlement	rectangular foundation, stone arrangement, well, graves, excavation.		Motu Hakamaru	194		2.2.1	Yamaguchi (1998)
MNH-8	ceremonial	curbstone lines (probably part of rectangular court), stone arrangement	Kahuirau or Patira	Porea	192			Yamaguchi (1998)

Archaeological sites in MANIHIKI and RAKAHANGA (atolls)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MNH-9	ceremonial + settlement	raised platform (probably house platform), curbstone lines (probably dwelling spaces), mound of coral blocks, well	Te Marae	Porea	193			Yamaguchi (1998)
RAK-1	ceremonial	mounded oven, excavation	Ivikakekake	Te Kainga	198			in preparation
RAK-2	ceremonial	upright, graves, excavation	Mua Marae	Te Kainga	195, 216	5.1.6	2.2.1	Buck (1932b), in preparation

Archaeological sites in PUKAPUKA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
PUK-W01a	habitation	excavation		Roto in Wale			2.2.1	Chikamori & Yoshida (1988)
PUK-W01b	habitation	excavation		Roto in Wale				in preparation
PUK-W01c	habitation	excavation		Roto in Wale				in preparation
PUK-W01d	habitation	excavation		Roto in Wale				in preparation
PUK-W01e	burial	excavation		Roto in Wale				in preparation
PUK-W02	burial	excavation		Ngake in Wale				Chikamori & Yoshida (1988)
PUK-W03	habitation	excavation		Roto in Wale				Chikamori & Yoshida (1988)
PUK-W04	habitation	excavation		Yato in Wale				Chikamori & Yoshida (1988)

Archaeological sites in PUKAPUKA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
PUK-W05	burial	excavation		Yato in Wale			2.2.1	Chikamori & Yoshida (1988)
PUK-W06	habitation	excavation		Ngake in Wale			2.2.1	Chikamori & Yoshida (1988)
PUK-W07	habitation	excavation		Roto in Wale				Chikamori & Yoshida (1988)
PUK-W08	habitation	excavation		Roto in Wale				Chikamori & Yoshida (1988)
PUK-W09	habitation + burial	excavated taro patch bank, from which an untanged basalt adz was retrieved.		Yato in Wale	34		2.2.1	in preparation
PUK-W10	ceremonial	uprights, oval ended enclosure, excavation		Roto in Wale	201, 216	5.2.2		Mcgregor (1935), Beagleholes (1938), Bellwood (1978), in preparation
PUK-W11	habitation + burial	taro patch bank, excavation		Roto in Wale			2.2.1	in preparation
(PUK-W12)	geomorphological	excavation		Ngake in Wale		2.2.1	2.2.1	in preparation

Archaeological sites in PUKAPUKA (atoll)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	ISLET NAME	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
PUK-MK1	habitation	excavation		Motu Ko				Chikamori & Yoshida (1988)
PUK-MK2	habitation	excavation		Motu Ko				Chikamori & Yoshida (1988)
PUK-MK3	habitation	excavation		Motu Ko				Chikamori & Yoshida (1988)
PUK-MK4	habitation	excavation		Motu Ko				Chikamori & Yoshida (1988)
PUK-MK5	habitation	excavation		Motu Ko				Chikamori & Yoshida (1988)
PUK-MKT1	habitation	excavation		Motu Kotawa				Chikamori & Yoshida (1988)
PUK-MKT2	habitation	excavation		Motu Kotawa				Chikamori & Yoshida (1988)
PUK-MKT3	habitation	excavation		Motu Kotawa				Chikamori & Yoshida (1988)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-001	quarry ?	large pit		Vaiakura				Trotter (1974)
RAR-002	ceremonial	marae ?	Avarua	Vaiakura				Duff (1974)
RAR-003	ceremonial	koutu ?, stone-lined well	Marau	Vaiakura				Duff (1974)
RAR-004	dwelling	house platform		Vaiakura				Parker (1974)
RAR-005	dwelling	house platforms		Vaiakura				Trotter (1974)
RAR-006	other	upright boundary stone		Vaiakura				Trotter (1974)
RAR-007	dwelling or subsistence ?	extensive terraces (some stone-faced)		Totokoitu				Trotter (1974)
RAR-008	traditional	reef passage	'Avarau	Avana				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-009	ceremonial	marae	Vaeora	Avana	139, 150, 158	4.1.5, 4.1.12, 4.1.14		Trotter (1974)
RAR-010	Christian	house foundation		Avana - Ngati-Maoate				Trotter (1974)
RAR-011	other	small coral outcrpo described as canoe mooring stone	Kiva	Avana				Trotter (1974)
RAR-012	ceremonial	marae, excavation, stone arrangement, pit oven	Mareva	Avana	33, 140, 144, 147, 148, 150, 160, 163, 186	4.1.9, 4.1.10, 4.1.11, 4.1.12, 4.1.14	4.1.1	Trotter (1974), Okajima (in preparation)
RAR-013	other	two commemorative stones of high chiefs		Avana				Trotter (1974)
RAR-014	ceremonial	marae	Iti'akaraua	Avana	150	4.1.12		Trotter (1974)
RAR-015	other	underwater stone traditionally described as landing place of a founding ancestor	Te Ka'a	Avana				Trotter (1974)
RAR-016 (Ngt.3)	ceremonial	marae	?	Avana	138, 139, 150, 158	4.1.4, 4.1.12, 4.1.14	4.1.1	Trotter (1974), Chikamori (1995)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-017	other	coral slab		Titikaveka				Trotter (1974)
RAR-018	traditional	reef passage		Ki'iki'i				Trotter (1974)
RAR-019	ceremonial	koutu	Arai-te-Tonga	Tupapa	160	4.1.14		Duff (1974), Bellwood (1970)
RAR-020	ceremonial	marae	Murivai ?	Tupapa	140, 152, 159			Trotter (1974)
RAR-021	ceremonial	marae	Taranga te Uru	Tupapa				Trotter (1974)
RAR-022	ceremonial + habitation	marae, excavation	Manuka	Tupapa	187		4.1.1	Wilkes (1974)
RAR-023	dwelling + ceremonial	T-shaped paepae	Te Maru O te Ta'iti	Tupapa				Duff & Duff (1974)
RAR-024	ceremonial	koutu	Pu-Kuru Va'a-nui	Ngati Moate	150	4.1.12		Duff (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-025	dwelling + ceremonial	T-shaped paepae	Pokata	Turangi		4.1.12		Duff & Duff (1974)
RAR-026	ceremonial	marae	Koroa	Tupapa	140, 152, 159			Trotter (1974)
RAR-027	ceremonial	marae, house platform	Te Papa-i-Vaiari	Tupapa	152			Trotter (1974)
RAR-028	ceremonial	marae	Raropua	Ki'iki'i				Trotter (1974)
RAR-029	ceremonial	marae	Aremarama	Tupapa				Trotter (1974)
RAR-030	traditional	mountain fortress said to have stone terraces, but not discovered		Turangi				Trotter (1974)
RAR-031	habitation	find spot of a horned type 1A basalt adz		Ngati-maoate				Trotter (1974)
RAR-032	ceremonial ?	small mound of stones marked by a short stone upright		Tupapa				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-033	ceremonial	marae	Pureora	Tupapa	140, 187		4.1.1	Wilkes (1974)
RAR-034	dwelling + ceremonial	T-shaped paepae	Are-Rangi	Tupapa			4.1.1	Duff & Duff (1974), Wilkes (1974)
RAR-035	ceremonial	marae	Ta'u-ma-keva	Titama	159			Trotter (1974)
RAR-036	ceremonial	koutu	Taputapu-atea	Takitumu District				Duff (1974)
RAR-037	ceremonial	marae	Takareu	Taku Va'ine				Trotter (1974)
RAR-038	dwelling	small house foundation, basalt slabs		Taku Va'ine				Trotter (1974)
RAR-039	traditional	boulder sculptured in form of a turtle, but not discovered		Tupapa				Trotter (1974)
RAR-040	habitation	excavation		Taku Va'ine			4.1.1	Bellwood (1978)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-041 (Ngt.4,5)	habitation	rock shelter, excavation		Avana	149		4.1.1	Chikamori (1995)
RAR-042	tradition	carved boundary stone, house foundation		Avana				Trotter (1974)
RAR-043	quarry ?	scattered percussion flakes of basalt		Tutakimoa				Trotter (1974)
RAR-044A	ceremonial	marae	Uianga-i-te-ata	Tikioki				Duff (1974)
RAR-044B	dwelling + ceremonial	T-shaped paepae		Tikioki	159	4.1.14		in preparation
RAR-045	ceremonial ?	stone seat in a surround of boulders		Avana				Trotter (1974)
RAR-046	dwelling + ceremonial	T-shaped paepae		Avana	150	4.1.12		Trotter (1974)
RAR-047	ceremonial	marae, 'are kariei (dancing place)	?	Inave				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-048	ceremonial ?	marae ?	?	Avana	138, 150, 159	4.1.12, 4.1.14		Bellwood (1970, 1978)
RAR-049	ceremonial	are kariei (dancing place)	Mataariki	Tupapa	131		4.1.1	Wilkes (1974)
RAR-050	settlement +ceremonial	house platforms, marae	Maugaroa	Vaiau-kura	135			Bellwood (1978)
RAR-051	settlement +ceremonial	house platforms, marae	Maugaroa	Vaiau-kura	135, 156, 163, 186	4.1.13		Bellwood (1978)
RAR-052	dwelling	house platform	Maungaroa	Vaiau-kura				Trotter (1974)
RAR-053	settlement +ceremonial	house platforms, marae	Maungaroa	Vaiau-kura	135, 156	4.1.13	4.1.1	Bellwood (1978)
RAR-054	settlement	house platforms	Maungaroa	Vaiau-kura	135			Bellwood (1978)
RAR-055	settlement +ceremonial	house platforms, T-shaped paepae		Rutaki	135			Bellwood (1978)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-056	other	boundary line of six upright stones		vaiakura				Trotter (1974)
RAR-057	subsistence	agricultural terraces		Avana	149, 150	4.1.12		Bellwood (1978)
RAR-058	other	stone seat		vaiakura				Trotter (1974)
RAR-059	ceremonial ?	stone seat, uprights, curbed line		vaiakura				Trotter (1974)
RAR-060	other	stone sears		Kavera				Trotter (1974)
RAR-061	ceremonial ?	eight boulders including possible seats and uprights		Akapuau				Trotter (1974)
RAR-062	ceremonial ?	stone upright, curbed line		Akapuau				Trotter (1974)
RAR-063	other	boundary stone		Tikioki				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-064	ceremonial ?	fallen upright		Tikioki				Trotter (1974)
RAR-065	other	paving, curbed line of 'Ara Metua		Tikioki				Trotter (1974)
RAR-066	ceremonial ?	fallen upright		Tikioki				Trotter (1974)
RAR-067	other	wall formed of heaped basalt boulders		Maii				Trotter (1974)
RAR-068	other	stone walls of 'Ara Metua		Maii				Trotter (1974)
RAR-069	dwelling	house platform		Avana				Trotter (1974)
RAR-070	dwelling	house platform		Avana				Trotter (1974)
RAR-071	other	coral paving of 'Ara Metua		Avana				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-072	other	basalt paving of 'Ara Metua		Avana				Trotter (1974)
RAR-073	ceremonial ?	large basalt upright, stone platform		Avana				Trotter (1974)
RAR-074	ceremonial ?	fallen upright		Ngati Vaikai				Trotter (1974)
RAR-075	other	basalt and coral paving of 'Ara Metua		Ngati-maoate				Trotter (1974)
RAR-076	other	basalt and coral paving of 'Ara Metua		Turangi				Trotter (1974)
RAR-077	other	curbed line, coral paving		Turangi				Trotter (1974)
RAR-078	other	curbed line of 'Ara Metua		Turangi				Trotter (1974)
RAR-079	ceremonial or dwelling ?	area 3.5 m by 2.1 m enclosed by curbed lines, surrounded by coral gravel		Turangi				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-080	ceremonial ?	large stone seats on either side of 'Ara Metua		Pouara				Trotter (1974)
RAR-081	ceremonial	marae		Pouara				Trotter (1974)
RAR-082	other	four stone seats, curbing		Matavera				Trotter (1974)
RAR-083	other	wall of basalt slabs, boundary stone		Matavera				Trotter (1974)
RAR-084	other	large boundary stone		Matavera				Trotter (1974)
RAR-085	other	two stone seats		Matavera				Trotter (1974)
RAR-086	ceremonial ?	stone seats, uprights, curbing on either side of 'Ara Metua		Matavera				Trotter (1974)
RAR-087	other	two small seats		Matavera				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-088	ceremonial ?	stone seat, upright, curbing		Titama				Trotter (1974)
RAR-089	other	boundary stone		Titama				Trotter (1974)
RAR-090	other	boundary stone		Tupapa				Trotter (1974)
RAR-091	other	boundary stone		Ki'iki'i				Trotter (1974)
RAR-092	ceremonial ?	three seats near 'Ara Metua, upright		Vaikai				Trotter (1974)
RAR-093	ceremonial	marae		Tokerau				Trotter (1974)
RAR-094	other	seat, two large boulders		Tokerau				Trotter (1974)
RAR-095	ceremonial ?	fallen upright		Inave				Trotter (1974)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-096	other	boundary markers on both sides of 'Ara Metua		Inave				Trotter (1974)
RAR-097	other	double row of basat curbing, coral gravel between rows.		Arerenga				Trotter (1974)
RAR-098	other	double row of basalt and coral curbing, coral gravel between rows/		Arerenga				Trotter (1974)
RAR-099	other	basalt and coral paving of 'Ara Metua		Aka'oa				Trotter (1974)
RAR-100	other	curbing of 'Ara Metua		Aka'oa				Trotter (1974)
RAR-101	dwelling ?	group of boulders, pssible house foundation		Aka'oa				Trotter (1974)
RAR-102	ceremonial ?	marae ?		Aka'oa				Trotter (1974)
RAR-103	dwelling + ceremonial	T-shaped paepae		Ngati Moate	150			Buck (1927), Bellwood (1978)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
RAR-104	ceremonial	marae	Vaevae Kiore ?	Ngati-moate	138, 150, 160, 214			Bellwood (1978)
RAR-105	ceremonial	marae, excavation		Turangi	140, 141, 143, 144, 147, 148, 149, 150, 156, 158, 163	4.1.6, 4.1.7, 4.1.8, 4.1.11, 4.1.12, 4.1.13		Bellwood (1978)
RAR-106	subsistence	agricultural terraces		Turangi	144, 149	4.1.12		Bellwood (1978)
RAR-107	subsistence	agricultural terraces		Turangi	144, 149	4.1.12		Bellwood (1978)
RAR-108	subsistence	agricultural terraces		Turangi	144, 149	4.1.12		Bellwood (1978)
RAR-109	subsistence	agricultural terraces?		Turangi	189			Bellwood (1978)
RAR-110	ceremonial	marae		Pokoinu				Bellwood (1978)
Ngt-001	habitation	taro patch, excavation		Avana				Chikamori (1995)

Archaeological sites in RAROTONGA (volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	TAPERE	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
Ngt-002	dwelling	house platform		Avana				in preparation
Ngt-003	see RAR-016							Trotter (1974), Chikamori (1995)
Ngt.004	see RAR-041			Avana				Chikamori (1995)
Ngt-005	see RAR-041			Avana				Chikamori (1995)
Ngt-006	geomorphological	excavation		Avana				in preparation
Ngt-007	ceremonial	marae		Avana	159	4.1.12		in preparation

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MAN-01	ceremonial	marae of 10 m square with a scatter of coral gravel	Tenoki	Veitatei	166			Bellwood (1978)
MAN-02	ceremonial	marae, but no artificial features survive	Tutakimata	Veitatei				Bellwood (1978)
MAN-03	ceremonial	marae of 10 m square with ascatter of coral gravel	Marae-papa	Veitatei				Bellwood (1978)
MAN-04	ceremonial	marae, but no archaeological features	Taku	Veitatei	166			Bellwood (1978)
MAN-05	ceremonial	marae, but no distinct features	Te-ua-rao-ovaia	Veitatei				Bellwood (1978)
MAN-06	ceremonial	marae consisting of 20 by 11 m rectangular, slightly raised flat area, enclosed with coral blocks	Areuna	Veitatei			4.2.1	Bellwood (1978)
MAN-07	ceremonial	marae consisting of 16 by 10 rectangular, artificial terrace covered with coral gravel, enclosed coral slabs	Maungaroa	Tamarua			4.2.1	Bellwood (1978)
MAN-08	ceremonial	marae, but no archaeological features	Motutapu	Tamarua				Bellwood (1978)

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MAN-09	habitation	rock shelter, a probable camp site		Tamarua				Bellwood (1978)
MAN-10	ceremonial	marae of 26 by 10 m artifical terrace, heavily disturbed	Aumoana	Tamarua	166	5.3.2	4.2.1	Bellwood (1978), Chikamori (1990)
MAN-11	dwelling ?	described as a chief's paepae (house foundation), 16 by 10 m enclosed rectangular area	O-te-ano	Karanga	187			Bellwood (1978)
MAN-12	ceremonial	marae of 31 by 13 m enclosed rectangular area on artificial terrace	'Are-vaka	Karanga			4.2.1	Bellwood (1978)
MAN-13	ceremonial	described as a 'are karioi (meeting place), heavily desturbed		Karanga				Bellwood (1978)
MAN-14	ceremonial	marae of 12.5 by 6 m rectangular enclosed area	Pare-i-te-paeru	Karanga				Bellwood (1978)
MAN-15	ceremonial	marae consisting of 22 by 16 m rectangular enclsoed flat area and stone alignment at the center	Taumatini	Ivirua	174		4.2.1	Bellwood (1978), Chikamori (1990)
MAN-16	ceremonial	marae of 35 by 11 m enclosed rectangular area	Maputu	Ivirua	187		4.2.1	Bellwood (1978)

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MAN-17	ceremonial	marae of 15 by 8 m enclosed rectangular area	Ivanui	Ivirua	166, 177, 206		4.2.1	Bellwood (1978)
MAN-18	ceremonial	marae of three rectangular earthen platforms enclosed with coral slab facings	Te-atuapai	Ivirua	166, 187			Bellwood (1978)
MAN-19	ceremonial	marae, but little features surviving except an excavated terrace of 25 by 14 m	Maramara-atua	Tavaenga				Bellwood (1978)
MAN-20	ceremonial	marae, but little features surviving except coral gravel scattered on 5 m square	Marae-teva	Tavaenga				Bellwood (1978)
MAN-21	ceremonial	marae, but little features surviving except coral gravel scattered on 18 by 10 m	Arakerake	Tavaenga				Bellwood (1978)
MAN-22	ceremonial	marae consisting of a low earthen platform of 24 by 11 m faced with coral slabs	Arangirea	Tavaenga	174		4.2.1	Bellwood (1978), Chikamori (1990)
MAN-23	ceremonial	marae, but nothing surviving except a spread of coral gravel	Karora	Tavaenga				Bellwood (1978)
MAN-24	burial	burial cave consisting of a passage some 10 m high	Te-rua-rere	Tavaenga				Bellwood (1978)

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MAN-25	ceremonial	marae consisting of 20 by 9 m rectangular artificial terrace, enclosed with coral slabs	Rangi-ta'ua	Keia	171, 174, 177, 206		4.2.1	Bellwood (1978), Chikamori (1990)
MAN-26	ceremonial	described as an 'are karioi, artificial terrace of 21 by 11.5 m enclosed with curbstones, having a small squar enclosure within it	'Are-Karioi	Keia	171, 174, 187, 206, 214, 215	4.2.3		Bellwood (1978), Chikamori (1990)
MAN-27	ceremonial	marae, but nothing surviving except coral gravel	Mau-tokerau	Keia	166, 171			Bellwood (1978)
MAN-28	ceremonial	marae of 15 by 9 m rectangular, partially enclosed	Tukituki-mata	Keia		4.2.3	4.2.1	Bellwood (1978), Chikamori (1990)
MAN-29	ceremonial	marae consisting of 7 by 10.5 m rectangular coral pavement with a platform of two courses of coral blocks capped by a large slab	Orongo	Keia	166, 168, 171, 174, 177, 178, 181, 206	4.2.2	4.2.1	Bellwood (1978)
MAN-30	ceremonial	marae, but no structures surviving	Vaimarama	Keia		4.2.2		Bellwood (1978)
MAN-31	traditional	described as large pit oven (umu), but no trace is obserbable		Keia				Bellwood (1978)
MAN-32	ceremonial	marae, but no traces surviving	Marae-ara	Keia	180	4.2.3	4.2.1	Bellwood (1978), Chikamori (1990)

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MAN-33	ceremonial	marae, but no traces surviving	Akaoro	Keia		4.2.3		Bellwood (1978), Chikamori (1990)
MAN-34	ceremonial	marae, but no traces surviving	Araata	Keia	166	4.2.3		Bellwood (1978), Chikamori (1990)
MAN-35	ceremonial	marae, surveyed by Chikamori, but no description.		Keia		4.2.3		Chikamori (1990)
MAN-36	ceremonial	marae, surveyed by Chikamori, but no description.		Keia		4.2.3		Chikamori (1990)
MAN-37	ceremonial	marae, surveyed by Chikamori, but no description.		Vaitatei				Chikamori (1990)
MAN-38	ceremonial	marae, surveyed by Chikamori, but no description.		Tamarua				Chikamori (1990)
MAN-44	habitation	probable camp site in a rockshelter, excavation		Veitatei				Kirch, et al. (1991), Kirch, et al. (1992), Kirch, et al. (1994), Kirch, et al. (1995)
?	habitation	probable fishing camp on coastal terrace, excavation	Vairoronga	Keia				Igarashi (1996)

Archaeological sites in MANGAIA (Makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
?	habitation	probable camp site in a rockshelter, excavation	Ngaaitutaki	Ivirua				Igarashi (1996)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-01	ceremonial	D3 marae consisting of a platform with two parallel rows of close-set, unworked, upright basalt stones	Toka-pu-moana	Vaitupa	227			Bellwood (1978)
AIT-02	traditional	large block of coral limestone, traditionally described as erected by a man as his god		Vaitupa	205			Bellwood (1978)
AIT-03	ceremonial	a rectangular pavement of large house (paepae)	Are Karioi	Vaitupa				Bellwood (1978), Duff (1974)
AIT-04	traditional	a large natural block of basalt lying on the beach, traditionally associated with a person who stole stones from a marae		Vaitupa				Bellwood (1978)
AIT-05	ceremonial	D2 marae consisting of a scatter of stones	Kaimoko	Vaitupa				Bellwood (1978)
AIT-06	ceremonial	D5 marae, but heavily disturbed	Te Autapu	Vaitupa	205			Bellwood (1978)
AIT-07	ceremonial	unclassifiable comple, containing two rectangular enclosures and probable house foundations (paepae)	Kakeu-te-rangi	Anaunga				Bellwood (1978)
AIT-08	traditional	natural boulders on the beach		Anaunga				Bellwood (1978)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-09	traditional	natural boulders on the beach		Anaunga				Bellwood (1978)
AIT-10	ceremonial ? + habitation + burial	described as marae but nothing surviving. The excavation suggests the site was residential area and then used as a cemetery.	Aurupe-te-rangi or Ureia	Arutanga				Buck (1927: 209), Bellwood (1978), Allen & Stedman (1990)
AIT-11	traditional	nothing surving	Paepae Nui Tuavaru	Arutanga				Bellwood (1978)
AIT-12	traditional	two natural stones of basalt described as the gods of Tangaroa and Rongo	Marae Tangaroa	Arutanga	205			Bellwood (1978)
AIT-13	traditional	stones buried beneath the concrete floor of the present shed, but nothing visible	O Rongo	Arutanga				Bellwood (1978)
AIT-14	ceremonial ?	completely destroyed, but there was said to be a line of uprights	Paepae Kautea	Arutanga				Bellwood (1978)
AIT-15	ceremonial ?	marae, but nothing surviving	Are-pure-atua	Arutanga				Bellwood (1978)
AIT-16	ceremonial	D2 marae with two parallel rows of uprights	Kaionu	Arutanga				Bellwood (1978)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-17	ceremonial ?	marae, but completely destroyed	Kopu-te-rangi	Arutanga				Bellwood (1978)
AIT-18	ceremonial	D2 marae with a single alignment of nine stones	Tai-pu-tera	Arutanga				Bellwood (1978)
AIT-19	traditional	associated with an earth oven where the bodies of the dead were said to be cooked, but no archaeological features uncovered	Umu Nukunoni	Arutanga				Bellwood (1978)
AIT-20	dwelling + ceremonial	site complex consisting of some marae and house foundations (paepae)	Nukunoni	Arutanga				Bellwood (1978)
AIT-21	traditional	a basalt block described as the footprint of the god of Tane		Arutanga	205			Bellwood (1978)
AIT-22	ceremonial	D2 marae consisting three parallel rows of uprights	Parataito	Taravao				Bellwood (1978)
AIT-23	ceremonial	D2 or D4 marae consisting of two distinct clusters of uprights	'Aremango	Taravao				Bellwood (1978), Duff (1974)
AIT-24	ceremonial	D1 marae consisting of two uprights	Kaimoko	Taravao				Bellwood (1978)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-25	ceremonial	D4 marae consisting of several rows of uprights and two platform (atarau)	Te Tapere	Taravao	204			Bellwood (1978), Duff (1974)
AIT-26	ceremonial	AIT-26 & 27 may be regarded as a single marae, consisting several rows of uprights and a platform	Paengariki	Taravao				Bellwood (1978), Duff (1974)
AIT-27	ceremonial	AIT-26 & 27 may be regarded as a single marae, consisting several rows of uprights and a platform (atarau)	Paengariki	Taravao				Bellwood (1978), Duff (1974)
AIT-28	traditional	no archaeological features surviving, but described as settlement		Taravao				Bellwood (1978)
AIT-29	traditional	no archaeological features surviving, but described as settlement		Taravao				Bellwood (1978)
AIT-30	traditional	no archaeological features surviving, but described as settlement		Taravao				Bellwood (1978)
AIT-31	ceremonial	D2 marae consisting of a row of uprights and an unusual V-shaped enclosure	Nukumanini	Taravao				Bellwood (1978)
AIT-32	ceremonial	D1 marae consisting of three or four uprights	A'u-aitu	Taravao	204			Bellwood (1978)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-33	dwelling	an earthen terrace faced with basalt blocks (Type C2 paepae)	Paepae-te-Rongo	Taravao				Bellwood (1978)
AIT-34	ceremonial	D1 marae apparently once consisting of a line of three uprights	Atetava	Tautu	204, 227			Bellwood (1978)
AIT-35	ceremonial	D2 marae consisting of three or four lines of uprights and a single upright standing alone	Vai-roro-i-te-mata-o-ai	Tautu	227	5.3.1		Bellwood (1978)
AIT-36	ceremonial	D4 (?) marae consisting of three rows of irregular uprights and the remains of platform (atarau)		Tautu				Bellwood (1978), Duff (1974)
AIT-37	ceremonial	D3 marae consisting of a damaged platform (atarau) and a row of uprights	Pokotutu	Tautu	204, 227			Bellwood (1978), Duff (1974)
AIT-38	traditional	nothing surviving, but described as the stone-line swimming or bathing pools	Tuakoro	Tautu				Bellwood (1978)
AIT-39	ceremonial	completely destroyed marae	Nukupure	Tautu				Bellwood (1978)
AIT-40	dwelling	completely destroyed house foundation (paepae)	Katara	Tautu				Bellwood (1978)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-41	traditional	a single, large basalt upright, called the stone of Ue	Ue	Tautu				Bellwood (1978)
AIT-42	ceremonial	D1 marae consisting simply of two uprights of basalt	Paepae Arueia	Tautu				Bellwood (1978)
AIT-43	ceremonial	D2 marae inwhich two rows of uprights survive	Maramanui	Tautu				Bellwood (1978)
AIT-44	ceremonial	D1 marae consisting simply of two uprights of basalt	Puta-i-vaerua	Avanui				Bellwood (1978)
AIT-45	ceremonial	D1 marae consisting of a single upright of coral	Pare-ka-vakevake	Motu Papa'u				Bellwood (1978)
AIT-46		the description may be provided by Allen (1991), but I have not had the chance of referring to it.						Allen (1991)
AIT-47	habitation	the description may be provided by Allen (1991), but I have not had the chance of referring to it.		Amuri ?				Allen (1991), Stedman (1991)
AIT-48	habitation	the description may be provided by Allen (1991), but I have not had the chance of referring to it.		Arutanga ?				Allen (1991), Stedman (1991)

Archaeological sites in AITUTAKI (atoll and volcanic island)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AIT-49	habitation	the description may be provided by Allen (1991), but I have not had the chance of referring to it.		Anaunga ?				Allen (1991), Stedman (1991)
AIT-50	habitation	the description may be provided by Allen (1991), but I have not had the chance of referring to it.		Amuri ?				Allen (1991), Stedman (1991)
?	ceremonial	marae with two rows of uprights		Vaitupa				Bellwood (1978: 117)
?	habitation	two possible occupation layers in the section cut by high seas		Rapota Islet				Bellwood (1978: 117)
AIT-MR1	fishing camp + quarry	small caves, and the excavation suggests one of them (MR-1) was used for basalt quarrying and possibly for a fishing camp		Moturakau Islet				Bellwood (1978: 117), Allen, Schubel (1990)
?	fortification ?	a linear ditch some 40 m long and 1.5 m deep, which cut across a small ridge between two stream valleys		Avanui				Bellwood (1978: 117)

Archaeological sites in ATIU (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AT-01	traditional +burial ?	a protohistoric trench cut in the makatea, which is said to have once contained the body of Marike.	Marike	Te Enui				Trotter (1974: 117)
AT-02	habitation	scattered coral gravel, black stained soil, charcoal, burnt basalt stones, and flakes.		Te Enui				Trotter (1974: 117)
AT-03	habitation or dwelling	coral gravel and some basalt stones.		Te Enui				Trotter (1974: 117)
AT-04	burial	a burial cave, in which were bone-containers made from cut sections of dug-out canoe hulls, scattered human bones and so forth.	Vaiari	Te Enui				Trotter (1974: 102, 117)
AT-05	dwelling ?	scattered coral gravel		Te Enui				Trotter (1974: 117)
AT-06	burial	a burial cave containing a few bones but no artifacts and burial goods.	Te-Ana-a-Raka	Mapumai				Trotter (1974: 100, 117)
AT-07	dwelling?	an earth oven 1.2 m in diameter and 50 cm deep.		Te Enui				Trotter (1974: 118)
AT-08	ceremonial ? or dwelling ?	a five meter long wall of rough coral blocks on the hillside.		Te Enui				Trotter (1974: 118)

Archaeological sites in ATIU (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AT-09	ceremonial	eight rectangular structures outlined on the ground with slabs of coral limestone and sections of stalactites.	Marau	Ngatiarua	208, 210	5.3.3		Trotter (1974: 108, 118)
AT-10	burial	a burial cave containing small groups of human bones and one end-pieces of a canoe-hull bone-container.	Te-Ana-o-Kuekue	Ngatiarua				Trotter (1974: 101, 118)
AT-11	ceremonial	a marae with walls made mainly of rough coral blocks with some stalactites.	Orongo	Ngatiarua	208			Trotter (1974: 105, 118)
AT-12	habitation	a layer of black soil containing charcoal, burnt basalt stones and coral gravel.		Ngatiarua				Trotter (1974: 118)
AT-13	?	a rectangular structure of stalactites lying on the ground.		Mapumai	208			Trotter (1974: 118)
AT-14	burial	an impressive protohistoric burial vault on a rectangular platform.	Paikea	Mapumai				Trotter (1974: 118)
AT-15	burial	a protohistoric burial vault		Mapumai				Trotter (1974: 113, 118)
AT-16	ceremonial	a protohistoric marae marked by rows of stalactites lying on the ground.	Apiripiri	Tengatangi ?	208			Trotter (1974: 118)

Archaeological sites in ATIU (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AT-17	ceremonial + habitation	Traditionally a marae, with evidence of habitation given by scattered coral gravel and one large stalactite on a small triangular terrace overlooking a taro swamp.	Manoa	Mapumai	208			Trotter (1974: 118)
AT-18	habitation ? or dwelling ?	coral gravel and small stalactite set upright in the ground on a terrace.		Tengatangi				Trotter (1974: 118)
AT-19	habitation ? or dwelling ?	coral gravel scattered on a terrace.		Tengatangi				Trotter (1974: 118)
AT-20	ceremonial	a marae consisting a 37 m long wall of coral slabs which enclose a level platform.	Vairakaia	Tengatangi	208, 215	5.3.3		Trotter (1974: 109, 118)
AT-21	habitation ? or dwelling ?	scattered coral gravel on a terrace.		Tengatangi				Trotter (1974: 118)
AT-22	habitation	a layer of coral gravel, beach shells and charcoal.		Ngatiarua				Trotter (1974: 118)
AT-23	habitation	scattered coral gravel on a terrace, on which a basalt adze was found.		Ngatiarua ?				Trotter (1974: 118)

Archaeological sites in ATIU (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AT-24	pathway	a ten meter long section of paved pathway selected pieces of makatea coral.		Tengatangi				Trotter (1974: 118)
AT-25	cave + pathway	a cave, outside of which there was a 30 meter long section of pathway paved with pieces of makatea coral.	Te-Ana-o-Kovi	Tengatangi				Trotter (1974: 118)
AT-26	pathway	a two hundred meter length of paved pathway through rough makatea.		Tengatangi				Trotter (1974: 118)
AT-27	traditional + marae	Traditionally a marae, with scattered coral gravel and a stalactite.		Areora	208			Trotter (1974: 119)
AT-28	ceremonial ?	a basalt stone seat with a stalactite back-rest.		Areora				Trotter (1974: 119)
AT-29	traditional + marae	a traditional marae comprising a large area of coral gravel, several stalactites, and a small rectangular outline structure of coral blocks.	Arangirea	Areora	208			Trotter (1974: 119)
AT-30	pathway	several sections of paving on a path over the makatea.		Areora				Trotter (1974: 119)
AT-31	habitation ? or dwelling ?	coral gravel (some burnt) and scattered marine shells.		Areora				Trotter (1974: 119)

Archaeological sites in ATIU (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
AT-32	burial ?	Reputedly a burial cave but no bones were seen.	Pau-atea	Areora				Trotter (1974: 119)

Archaeological sites in MAUKE (makatea)

SITE CODE	SITE CLASS	FEATURES	SITE NAME	DISTRICT or ISLET	LOCATION IN THIS THESIS			OTHER REFERENCES
					TEXT (pages)	FIGURE	TABLE	
MKE-01	dwelling + excavation	a large and detail excavation which revealed an early settlement site.	Anai'o					Walter (1993, 1998)

RADIOCARBON AGES FROM TONGAREVA ATOLL, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
NZ-1921	ceremonial	TON-01	7	charcoal		380 ± 50					1448 - 1525	1435 - 1648	52
	The sample was collected from the lower part (Layer 7) of a mounded oven named a "turtle oven" by Bellwood (Bellwood 1978: 190).												
ANU-1152	ceremonial	TON-01	9	charcoal		270 ± 100					1487 - 1954	1438 - 1955	52
	The sample was collected from the lowest part (Layer 9) of a mounded oven named a "turtle oven" by Bellwood (Bellwood 1978: 190).												
N-5590	ceremonial	TON-03	3	charcoal		370 ± 75					1445 - 1643	1419 - 1952	52, 58
	The sample was collected from the lower part (Layer 3) of a mounded oven within an oval courtyard, which contained heat-shattered coral lumps with charcoal debris and some heated fragments of Pinctada margaritifera (Yamaguchi 1995: 54).												
N-5591	ceremonial	TON-03	4	charcoal		330 ± 80					1460 - 1657	1433 - 1954	47, 52, 58
	The sample was collected from the lowest part (Layer 4) of a mounded oven within an oval courtyard. The layer contained heat-shattered coral lumps and charcoal debris with many fragments of Tridacna maxima, Pinctada margaritifera, turtle bone and shell, all of which were well heated (Yamaguchi 1995: 54).												
N-5656	ceremonial	TON-03	3～4	charcoal		190 ± 80					1651 - 1954	1515 - 1955	
	The sample was collected from the lowest part (Layer 4) of a mounded oven within an oval courtyard. The date is considerably later than that of N-5591, but there is the possibility that this sample fell down from the upper Layer (Yamaguchi 1995: 54).												
WK-4090	ceremonial	TON-19	2	charcoal	Monocotyledon tissue	184 ± 116	-24.9 ± 14.0	-25.6 ± 0.2	-23.7 ± 17.0	97.6 ± 1.7	1641 -1955	1456 -1955	52
	The sample was collected from Layer 2 which lay just beneath the surface soil covering TON-19 rectangular marae.												
WK-4091	ceremonial	TON-21	2	charcoal	Pemphis acidula	470 ± 130	-56.9 ± 11.5	-25.0 ± 0.2	-56.9 ± 14.0	94.3 ± 1.4	1327 - 1627	1286 -1953	28, 52, 55, 56
	The sample was collected from Layer 2 which lay just beneath the surface soil covering TON-21 rectangular marae. The layer contained culturally derived materials such as flecks of charcoal and several fragments of turtle plastron.												
ANU-10218	ceremonial	TON-21	2	turtle	Chelonia mydas ?	620 ± 60	-65.0 ± 6.2	-19.9 ± 0.2	-74.4 ± 7.2	92.5 ± 0.6	1673 - 1832	1544 - 1867	52, 55, 56
	The sample was collected from Layer 2 of brownish gray coral gravel with sand within the rectangular court of TON-21 marae.												
R-21336	ceremonial	TON-28/I	3 upper	charcoal	Monocotyledon tissue, Pemphis acidula	81 ± 61	-19.8 ± 7.4	-27.1	-15.5 ± 7.5	98.45 ± 0.75	1688 - 1955	1671 - 1955	52
	The sample was collected from the layer of yellowish gray sand lying beneath the ahu of TON-28/I rectangular marae.												

RADIOCARBON AGES FROM TONGAREVA ATOLL, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
WK-4532	settlement	TON-28/III	2	charcoal	Monocotyledon tissue, Pemphis acidula, Guettardia speciosa	270 ± 50	-35.6±4.5	-26.1±0.2	-33.5±5.5	96.7±0.6	1529 - 1952	1486 - 1954	68
	The sample was collected from Layer 2 of brownish black soil with gray sand within TON-28 settlement site consisting several house foundations.												
NZ-1920	settlement	TON-28/III	-	charcoal		200 ± 60					1654 - 1954	1529 - 1955	68
	The sample was collected from an occupation level about 10 to 20 cm thick beneath the paving stones within a house foundation in TON-28 settlement site (Bellwood 1978: 186).												
ANU-1156	ceremonial	TON-29	-	Tridacna		710 ± 70		-2.7±0.2[4]			1301 - 1423	1248 - 1462	51, 52
	The sample was collected from a fill of the platform (ahu) of TON-29 rectangular marae, but the date would not be associated with the construction of this marae (Bellwood 1978: 176).												
WK-4092	ceremonial	TON-33	2	charcoal	Monocotyledon tissue, Tournefortea argentea	152 ± 70	-21.1±8.3	-26.1±0.2	-19.0±10.2	98.1±1.0	1665 - 1955	1643 -1955	52, 53, 54
	The sample was collected from the layer of brownish black sand with coral gravel lying beneath the surface layer of coral gravel within the rectangular court of TON-33 marae.												
NUTA-2081	ceremonial	TON-33	grave	bone		140 ± 170		-19.0±2.0[3]			1462 - 1955	1399 - 1955	52, 53, 59
	The sample was collected from a fill of a grave (G2) located on the southern side of TON-33 rectangular marae.												
N-5594	subsistence & habitation	TON-35	3	shell	Tridacna sp.	140 ± 70		2.7±0.2[4]			1676 - 1870	1514 - 1868	52
	The sample was collected from the layer of dark brown sand accumlated on the lagoon beach around site TON-35 fishpond. The layer contained pearl shell fishhooks and coconut scrapers (Yamaguchi 1995: 71).												
N-5586	subsistence & habitation	TON-35	3	shell	Tridacna sp.	310 ± 70		2.7±0.2[4]			1517 - 1677	1465 - 1725	52, 60
	The sample was collected from the layer of dark brown sand accumlated on the lagoon beach around site TON-35 fishpond. The layer contained pearl shell fishhooks and coconut scrapers (Yamaguchi 1995: 71).												
N-5589	subsistence & habitation	TON-35	3	shell	Tridacna sp.	340 ± 70		2.7±0.2[4]			1494 - 1662	1449 - 1700	52, 60
	The sample was collected from the layer of dark brown sand accumlated on the lagoon beach around site TON-35 fishpond. The layer contained pearl shell fishhooks and coconut scrapers (Yamaguchi 1995: 71).												
NUTA-2086	graveyard	TON-36	-	bone		700 ± 160		-19.0±2.0[3]			1037 - 1383	897 - 1439	28, 38, 50, 52, 58
	The sample was collected from a fill of the large grave within TON-36 graveyard. This is one of earliest dates from Tongareva Atoll (Yamaguchi 1995: 61), but it has a very large error range and the dating of human bone is frequently unreliable.												

RADIOCARBON AGES FROM TONGAREVA ATOLL, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-5593	habitation	TON-40, Unit. 6	2	charcoal		170 ± 75					1658 - 1955	1529 - 1955	
	The sample was collected from the layer of dark yellowish brown sand and coral gravel lying below the surface soil of TON-40 settlement site within Tautua Village (Yamaguchi 1995: 73).												
N-5592	habitation	TON-40, Unit. 2	3	charcoal		460 ± 75					1412 - 1480	1321 - 1638	28
	The sample was collected from the layer of yellowish brown sand and coral gravel, which was recognized only in the Unit. 2 (Yamaguchi 1995: 73).												
N-5588	geomorphologic	TON-40, Unit. 2	4	Tridacna		1220 ± 70		2.7±0.2[4]			698 - 875	653 - 965	
	The sample was collected from thebottom of Layer 4 consisting of yellowish gray sand which was naturally accumulated (Yamaguchi 1995: 73).												
N-5654	geomorphologic	TON-40, Unit. 4	6 (bed rock)	coral	aragonite	1790 ± 75		2.9±0.2[5]			84 - 264	BC5 - AD382	27, 28, 219
	The aragonite sample was collected from consolidated bedrock appearing from the bottom of Unit. 6, which would be an old reef flat (Chikamori 1995: 4, Yamaguchi 1995: 75).												
N-5655	geomorphologic	TON-40, Unit. 8	beachrock	shell	Tridacna sp.	1320 ± 75		2.9±0.2[5]			628 - 758	544 - 851	42
	The sample was collected from a cross-stratified and half-consolidated rock appearing in the Unit. 8 which was located closest to the present lagoon beach. The rock would be a old beach rock (Chikamori 1995: 4, Yamaguchi 1995: 77).												
N-5595	habitation	TON-41, Unit. 5	3	Tridacna		modern					modern		
	The sample was collected from the layer of browish black sand in an excavated unit located close to the lagoon beach of Te Puka, an islet lying at the southeasten corner of the atoll. The layer contained some pearl shell artifacts (Yamaguchi 1995: 78).												
WK-4093	habitation & dwelling	TON-45	bottom	charcoal	Cocos nucifera	modern	142.7±12.5	-24.9±0.2	114.3±1.5	114.3±1.5	affected by bomb effect		
	The sample was collected from the inside of a heap of Tridacna shells and coral fragments, which was found along with a house foundation within a clump of coconut trees in Maungarongaro, an islet lying on the southwestern part of the atoll. This sample giving the date of modern is a moot point, because the excavation revealed the heap would have served as reserve of heating materials and thus there is the high possibility that the charcoal sample was recently mixed through a gap between Tridacna shells.												
WK-4530	habitation & dwelling	TON-45	bottom	shell	Tridacna sp.	560 ± 40	-12.7±4.0	2.7±0.2	-67.4±4.6	93.3±0.5	1702 - 1869	1650 - 1866	124
	The sample was collected from the inside of a heap of Tridacna shells and coral fragments located within a clump of coconut trees in Maungarongaro, but the construction of this heap would not necessarily be of this date.												
WK-4531	habitation & dwelling	TON-47	2	charcoal	Monocotyledon tissue	mordern	-22.8±4.1	-25.1±0.2	'-22.7±5.1	97.7±0.5	modern		52, 58
	The sample was collected from a mounded oven surrounded with several house foundations on Hangarei, a mid-western islet.												

RADIOCARBON AGES FROM TONGAREVA ATOLL, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
ANU-10217	habitation & dwelling	TON-47	3	turtle	Chelonia mydas ?	960 ± 60	-111.2±5.8	-24.2±0.2	-74.4±7.2	88.7±0.6	1402 - 1475	1325 - 1521	28, 52, 58
	The sample was collected from the lowest layer of a mounded oven in Hangarei. The layer also contained quantities of turtle bones. The sample gave the conventional age of 960 ±60, but the calibrated date with the ΔR (45.0±30.0) for marin environment estimated from South Pacific indicates the almost same period to that of WK-4094.												
WK-4094	mounded oven in settlement	TON-47	3～4	charcoal	Monocotyledon tissue, Pemphis acidula	560 ± 50	-66.7±4.2	-24.8±0.2	-67.0±5.1	93.3±0.5	1321 - 1427	1302 - 1442	28, 52, 58
	The sample was collected from the bottom of a mounded oven in Hangarei. The sample gave the earliest date associated with the human settlement in the atoll.												

(1) Conventional ^{14}C ages are based on half-life of 5568 years, and applied with correction for isotopic fractionation apart from samples having laboratory-code "N".

(2) Calibrated ages are calculated with the CALIB 3.0. Samples originated from marine environment are calibrated with the ΔR (45.0±30.0)estimated from South Pacific .

(3) This is based on the approximate δ^{13} value for bone collagen (Bowman 1990: Table 10), which was applied for the Cal AD age of NUTA-2081 and 2086 samples.

(4) This value, the δ 13 value for WK-4530 (Tridacna), is applied for the calibration of ^{14}C ages originated from marine shells.

(5) This value, the δ 13 value for WK-4525 sample collected from Pukapuka, was applied for the calibration of ^{14}C ages originated from aragonite conglomerate.

RADIOCARBON AGES FROM MANIHIKI ATOLL, COOK ISLANDS.

Code-No.	Site type	Site provenance		sample features		Conventional age					Cal AD [2]		location in the text
		Site code	Layer	Material	species / type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-6141	habitation	MNH-7, Zone-A, Unit-3	I-1	charcoal		modern					modern	modern	
	The sample was collected from an excavated site on Motu Hakamaru, a southern islet. The layer was the surface soil containing humid dark brown sand and coral gravel (Yamaguchi 1998: 35).												
N-6146	habitation	MNH-7, Zone-A, Unit-4	I-3	charcoal		400 ± 70					1430 - 1631	1410 - 1654	
	The sample was collected from a layer containing dark brown sand and coral gravel. A fishhook of pearl shell was retrieved from this layer (Yamaguchi 1998: 35).												
N-6145	habitation	MNH-7, Zone-A, Unit-3	I-4	charcoal		380 ± 70					1443 - 1638	1419 - 1660	
	The sample was collected from a layer containing black sand, coral gravel and heat-shattered coral brocks. A pearl shell disk was retrieved from this layer (Yamaguchi 1998: 35).												
N-6149	habitation	MNH-7, Zone-A, Unit-4	I-4 (cut.4)	charcoal		400 ± 75					1437 - 1633	1407 - 1657	
	The sample was collected from Layer I-4 in Unit. 4, which corresponded to the same layer in Unit. 3.												
N-6147	habitation	MNH-7, Zone-A, Unit-4	I-4 (UMU-5a)	charcoal		400 ± 70					1430 - 1631	1410 - 1654	
	The sample was collected from the upper part of a pit oven dug from Layer I-4 appearing in Unit. 4.												
N-6148	habitation	MNH-7, Zone-A, Unit-4	I-4 (UMU-5b)	charcoal		330 ± 70					1472 - 1654	1438 - 1954	
	The sample was collected from the lower part of a pit oven dug from Layer I-4 appearing in Unit. 4.												
N-6142	habitation	MNH-7, Zone-A, Unit-3	II-1 (lower)	charcoal		430 ± 70					1430 - 1616	1402 - 1644	
	The sample was collected from a layer containing brownish gray sand (Yamaguchi 1998: 36).												
N-6663	habitation	MNH-7, Zone-A, Unit-3	II-1 (pit oven)	charcoal		590 ± 110					1293 - 1436	1239 - 1611	28
	The sample was collected from a pit oven which would have dug from Layer II-1. The fills of this pit oven contained heat-shattered coral blocks and charred materials (Yamaguchi 1998: 36).												

RADIOCARBON AGES FROM MANIHIKI ATOLL, COOK ISLANDS.

Code-No.	Site type	Site provenance		sample features		Conventional age					Cal AD [2]		location in the text
		Site code	Layer	Material	species / type	^{14}C yBP [1]	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
N-6150	habitation	MNH-7, Zone-A, Unit-4	II-1 (cut.6)	charcoal		640 ± 85					1287 - 1407	1238 - 1439	28
	The sample was collected from a layer of brownish gray sand appearing in Unit. 4, which corresponded to the same layer in Unit. 3.												
N-5863	habitation	MNH-7, Zone-A, Unit-2	II-1 or II-3?	charcoal		730 ± 75					1247 - 1304	1173 - 1401	28, 37
	The sample was collected from the same layer which produced N-6142, but the date is remarkedly earlier than the latter. There is thus the possibility that this sample was derived from the lower layer such as II-3 (Yamaguchi 1998: 36).												
N-6143	habitation	MNH-7, Zone-A, Unit-3	II-3	charcoal		600 ± 90					1295 - 1426	1271 - 1455	28
	The sample was collected from a layer containing brownish gray sand, which was the lowest cultural layer in site MNH-7 (Yamaguchi 1998: 36).												
N-6151	habitation	MNH-7, Zone-A, Unit-4	II-3 (cut.7)	charcoal		580 ± 80					1302 - 1431	1283 - 1455	28
	The sample was collected from the same layer which produced N-6143 in Unit 4 (Yamaguchi 1998: 36).												
N-6144	vegetation	MNH-7, Zone-A, Unit-3	III (lower)	plant material	Cocos nucifera	580 ± 80							
	The sample was roots of coconut tree stuck on the surface of algonite bed rock, and so it might be affected by carbonated calcium dissolved in underground water (Yamaguchi 1998: 36).												
N-6152	geomorphologic	MNH-7, Zone-A, Unit-3	IV (bedrock)	coral	aragonite	3740 ± 80		2.9±0.2 [5]			BC2375-BC2123	BC2466-BC1990	27, 28
	The sample was collected from the bottom of the excavated unit. It consisted of consolidated algonite which would be the old reef flat (Yamaguchi 1998: 36).												
N-5865	dwelling	MNH-9, Unit-A	1	charcoal		modern					modern	modern	
	The sample was collected from the surface soil covering a rectangular house foundation enclosed with coral curbstones (Yamaguchi 1998: 39).												
N-5880	dwelling	MNH-9, Unit-A	2	shell	Tridacna	240 ± 70		2.7±0.2 [3]			1628 - 1717	1512 - 1863	
	The sample was collected from a layer consisting of small coral gravel (kirikiri) which used to cover the floor of dwelling house (Yamaguchi 1998: 39).												

RADIOCARBON AGES FROM MANIHIKI ATOLL, COOK ISLANDS.

Code-No.	Site type	Site provenance		sample features		Conventional age					Cal AD [2]		location in the text
		Site code	Layer	Material	species / type	^{14}C yBP [1]	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
N-5866	dwelling	MNH-9, Unit-A	3 (pit oven)	charcoal		250 ± 70					1529 - 1954	1476 - 1954	
	The sample was collected from a pit oven appearing in upper part of Layer 3, which would be associated with a structure built on the curbed foundation (Yamaguchi 1998: 39-40).												
N-5864	habitation	MNH-9, Unit-A	3	charcoal		330 ± 75					1468 - 1655	1435 - 1954	
	The sample was collected from a layer of brownish gray and blackish brown sand and gravel which was covered by Layer 2 of kirikiri. The date would be associated with activities prior to the construction of house foundation (Yamaguchi 1988: 39).												
N-5881	geomorphologic	MNH-9, Unit-A	4 (upper)	shell	Tridacna	220 ± 70		2.7±0.2[3]			1643 - 1798	1514 - 1868	
	The sample was collected from a layer of bright yellowish brown sand containing no cultural material (Yamaguchi 1998: 39).												
N-5867	settlement	MNH-9, Unit-C	2 (UMU)	charcoal		200 ± 70					1651 - 1954	1520 - 1955	
	The sample was collected from the lower part of a mounded oven in MNH-9 settlement site, which consisted of coral sand, heat-shattered coral blocks and dark brown sand (Yamaguchi 1998: 39).												
N-5868	geomorphologic	MNH-9, test unit	-76cm	shell	Tridacna	830 ± 80		2.9±0.2[4]			1071 - 1277	1016 - 1320	
	The sample was collected from the bottom of an small excavated unit, in order to examine the soil accumlation in a dry inlet lying close to site MNH-9.												

(1) Conventional ^{14}C ages are based on half-life of 5568 years, and applied with correction for isotopic fractionation apart from samples having laboratory-code "N".

(2) Calibrated ages are calculated with the CALIB 3.0. Samples originated from marine environment are calibrated with the ΔR (45.0±30.0)estimated from South Pacific .

(3) This value, the δ 13 value for WK-4530 (Tridacna), is applied for the calibration of ^{14}C ages originated from marine shells.

(4) This value, the δ 13 value for WK-4525 sample collected from Pukapuka, was applied for the calibration of ^{14}C ages originated from calcite conglomerate.

RADIOCARBON AGES FROM RAKAHANGA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-5869	ceremonial & habitation	RAK-Tek-1	1 (middle)	charcoal		modern					modern	modern	198
	The sample was collected from the top soil of a large mounded oven in the islet of Tekainga. The layer contained humid black soil and heat-shattered coral lumps. Many fish bones, shells, turtles were retrieved from this layer. The details will be published from Keio University.												
N-6137	ceremonial & habitation	RAK-Tek-1	1 (lower)	charcoal		270 ± 70					1520 - 1953	1459 - 1954	
	The sample was collected from the lower part of Layer 1 of the mounded oven. The details will be published from Keio University.												
N-5870	ceremonial & habitation	RAK-Tek-1	2	charcoal		350 ± 70					1453 - 1647	1433 - 1953	
	The sample was collected from Layer 2 of the mounded oven containing grayish white sand and coral gravel with fish bones, shells, turtle bones, human bones and pearl shell fishhooks. The details will be published from Keio University.												
N-6138	ceremonial & habitation	RAK-Tek-1	2	charcoal		380 ± 90					1438 - 1644	1405 - 1953	
	The sample was collected from a layer of the mounded oven containing grayish white sand and coral gravel with fish bones, shells, turtle bones, human bones and pearl shell fishhooks. The details will be published from Keio University.												
N-6139	ceremonial & habitation	RAK-Tek-1	2	charcoal		590 ± 195					1269 - 1475	1028 - 1953	198
	The sample was collected from a layer of the mounded oven containing grayish white sand and coral gravel with fish bones, shells, turtle bones, human bones and pearl shell fishhooks. The conventional dates is earlier than other two dates from the same layer, but it has a very large error range. The details will be published from Keio University.												
N-5871	ceremonial & habitation	RAK-Tek-1	3	charcoal		200 ± 125					1527 - 1955	1443 - 1955	
	The sample was collected from a layer of the mounded oven containing brownish gray sand and coral gravel with fish bones, shells, turtle bones, human bones and a worked pearl shell fragment (probably a part of coconut grater). The date is younger than another date from the same layer and those from an upper layer, but it has a very lartge error range. The details will be published from Keio University.												
N-6140	ceremonial & habitation	RAK-Tek-1	3	shell	Tridacna	670 ± 70		2.7±0.2 [3]			1276 - 1396	1208 - 1438	
	The sample was collected from a layer of the mounded oven containing brownish gray sand and coral gravel with fish bones, shells, turtle bones, human bones and a worked pearl shell fragment (probably a part of coconut grater). The details will be published from Keio University.												
N-5882	ceremonial & habitation	RAK-Tek-1	3	shell	Tridacna	3740 ± 80		2.7±0.2 [3]			BC2368-BC2121	BC2464-BC1985	
	The sample was collected from a layer of the mounded oven containing brownish gray sand and coral gravel with fish bones, shells, turtle bones, human bones and pearl shell fishhooks. The details will be published from Keio University. The date is very earlier than others from the same layer. However, it was produced from Tridacna shell, and it would not be associated with the usage of this mounded oven. The details will be published from Keio University.												

RADIOCARBON AGES FROM RAKAHANGA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	$d^{14}C‰$	$\delta^{13}C‰$	$D^{14}C‰$	%Modern	1σ	2σ	
N-5883	ceremonial & habitation	RAK-Tek-1	5	shell	Tridacna	700 ± 90		2.7±0.2[3]			1234 - 1388	1122 - 1442	
	The sample was collected from the lowest cultural layer of mounded oven containing blackish brown snad and coral gravel with fish bones, shells and fishhooks. The details will be published from Keio University.												
N-5872	ceremonial & habitation	RAK-Tek-1	5?	charcoal		modern					modern	modern	
	The sample was collected from Layer 5 of mounded oven. However, the date is modern, and thus there is the possibility that the sample was fallen from a upper layer in the process of excavation. The detail will be published from Keio University.												
N-5885	ceremonial & habitation	RAK-Tek-2	2	shell	Tridacna	1010 ± 70		2.7±0.2[3]			934 - 1060	845 - 1173	
	The sample was collected from a site located in the middle of Te kainga. The area was called Mua Marae. The layer contained blackish brown sand and coral gravel with a pearl shell fishhook and a coconut grater. The date is earlier than others from a large pit (LP2) containg the similar soil. However, it was given from a Tridacna shell and would not be associated with the accumlation of this layer. The details will be published from Keio University.												
N-5877	ceremonial & habitation	RAK-Tek-2	LP2 (layer 2)	charcoal		560 ± 100					1302 - 1441	1279 - 1616	28, 197
	The sample was collected from a large pit dug from Layer 2 in Mua Marae and containing the similar soil to that of Layer 2. A fishhook was retrieved from this pit. The details will be published from Keio University.												
N-5873	ceremonial & habitation	RAK-Tek-2	3	charcoal		620 ± 95					1289 - 1418	1238 - 1449	28
	The sample was collected from a layer containing brownish gray sand and coral gravel. A worked pearl shell fragment and a turtle plastron was retrieved from this layer. The detail will be published from Keio University.												
N-5876	ceremonial & habitation	RAK-Tek-2	3	charcoal		670 ± 140					1242 - 1416	1041 - 1478	28
	The sample was collected from a layer containing brownish gray sand and coral gravel. A pearl shell fishhook was retrieved from this layer. The detail will be published from Keio University.												
N-5875	ceremonial & habitation	RAK-Tek-2	4	charcoal		880 ± 120					1022 - 1280	898 - 1379	28
	The sample was collected from a layer containing brownish gray sand with blackish brown sand and coral gravel. A worked pearl shell fragment and a turtle plastron was retrieved from this layer. The detail will be published from Keio University.												
N-5874	ceremonial & habitation	RAK-Tek-2	4	charcoal		1060 ± 85					892 - 1030	786 - 1168	28, 37, 198
	The sample was collected from a layer containing brownish gray sand with blackish brown sand and coral gravel. A worked pearl shell fragment and a turtle plastron was retrieved from this layer. The detail will be published from Keio University.												

RADIOCARBON AGES FROM RAKAHANGA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-5886	geomorphologic	RAK-Tek-2	5 (upper)	shell	Tridacna	1940 ± 75		2.7±0.2[3]			BC89 - AD 102	BC185 - AD 198	28
	The sample was collected from a natural layer containing brownish gray gravel and large coral blocks with no cultural materials. The date would be associated with the formation of Te Kainga, an coral islet of this atoll. The detail will be published from Keio University.												
N-5884	geomorphologic	RAK-Tek-2	5 (lower)	shell	Tridacna	2840 ± 85		2.7±0.2[3]			BC1225-BC964	BC1353-BC845	27, 28
	The sample was collected from a natural layer containing brownish gray gravel and large coral blocks with no cultural materials. The date would be associated with the formation of Te Kainga, an coral islet of this atoll. The detail will be published from Keio University.												

(1) Conventional ^{14}C ages are based on half-life of 5568 years, and applied with correction for isotopic fractionation apart from samples having laboratory-code "N".

(2) Calibrated ages are calculated with the CALIB 3.0. Samples originated from marine environment are calibrated with the ΔR (45.0±30.0)estimated from South Pacific .

(3) This value, the δ 13 value for WK-4530 (Tridacna), is applied for the calibration of ^{14}C ages originated from marine shells.

RADIOCARBON AGES FROM PUKAPUKA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-5101	habitation	PUK-W01-A4	2	shell	Tridacna	2240 ± 60		2.6±0.2 [3]			BC403-BC317	BC518-BC184	28, 35
	The sample was collected in 1985 from an excavated site located behind C.I.C.C. in Roto Village. The date was given from a Tridanca shell, and so it would not be associated with the human colonisation. The detail on the soil of Layer 2 is unclear (Chikamori & Yoshida 1988).												
R-21575	burial	PUK-W01-E1	4	charcoal		647 ± 75	-81.4 ±8.5	-24.3	-82.7 ±8.6	91.73±0.86	1288 - 1403	1253 - 1432	
	The sample was collected in 1995 from an excavated unit in site W01. A concentration of chacoal flecks appeared in the layer which contained brownish gray sand. A burial pit wad dug into this layer. The details will be published from Keio University.												
N-5102	burial	PUK-W02-12	3	charcoal		210 ± 60					1651 - 1954	1525 - 1955	
	The sample was collected in 1985 from an excavated site located close to a cemetary (Muliwutu) in Ngake Village. The detail on the soil of Layer 3 is unclear (Chikamori & Yoshida 1988).												
N-5105	habitation	PUK-W02-12	4	charcoal		350 ± 65					1456 - 1646	1435 - 1952	
	The sample was collected in 1985 from an excavated site located close to a cemetary (Muliwutu) in Ngake Village. Many artifacts including pearl shell fishhooks were retrieved from the same Layer 4. The detail on the soil of this layer is unclear (Chikamori & Yoshida 1988)												
N-5104	habitation	PUK-W02-12	5a	charcoal		430 ± 75					1428 - 1619	1400 - 1647	
	The sample was collected in 1985 from an excavated site located close to a cemetary (Muliwutu) in Ngake Village. The detail on the soil of Layer 5 is unclear (Chikamori & Yoshida 1988)												
N-5103	habitation	PUK-W02-13	4	charcoal		425 ± 75					1430 - 1621	1401 - 1649	
	The sample was collected in 1985 from an excavated site located close to a cemetary (Muliwutu) in Ngake Village. Many artifacts including pearl shell fishhooks were retrieved from the same Layer 4. The detail on the soil of this layer is unclear (Chikamori & Yoshida 1988)												
N-5106	burial	PUK-W05-2	2	charcoal		1490 ± 65					539 - 644	426 - 666	28
	The sample was collected in 1985 from an excavated site located close to a cemetary in Yato Village. Human skeletal remains were also retrieved from the same layer. The detail of the layer is unclear (Chikamori & Yoshida 1988).												
N-5107	habitation	PUK-W06-1	4	charcoal		1800 ± 75					132 - 338	71 - 416	28, 35
	The sample was collected in 1985 from an excavated site in Ngake Village close to the lagoon shore. The layer consisted of debris accumlated by tidal wave (Chikamori & Yoshida 1985).												
N-5108	habitation	PUK-W07	pit	charcoal		modern					modern	modern	
	The sample was collected in 1985 from a large and deep pit appearing in an excavated unit located close to the lagoon shore of Roto Village. The detail of the layer is unclear (Chikamori & Yoshida 1988).												

RADIOCARBON AGES FROM PUKAPUKA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	$d^{14}C‰$	$\delta^{13}C‰$	$D^{14}C‰$	%Modern	1 σ	2 σ	
N-5109	habitation	PUK-W07	pit	charcoal		modern					modern	modern	
	The sample was collected in 1985 from a large and deep pit appearing in an excavated unit located close to the lagoon shore of Roto Village. The detail of the layer is unclear (Chikamori & Yoshida 1988).												
WK-5082	habitation	PUK-W09-1	2	charcoal	Cocos nucifera, Timonius Polyanthus, Suriana maritima ?	modern		-25.1 ±0.2		98.2±0.5	modern	modern	
	The sample was collected in 1995 from a layer just beneath the surface soil of a taro patch bank. The layer contained brownish black sand and gravel. The detail will be published from Keio University.												
WK-4524	habitation & subsistence	PUK-W09-2	11	shell	Tridacna	2590 ± 50	-232.9 ±4.1	2.6±0.2	-275.2 ±4.7	72.5±0.5	BC347-BC171	BC379-BC96	28, 35
	The sample was collected in 1995 from the lowest cultural layer in site W09 located on a taro patch bank. A samoan type adze was retrieved from this layer, but the date from Tridacna shell would not necessarily was associated with the accumlation of this layer. The detail will be published from Keio University.												
WK-5086	ceremonial	PUK-W10-6C	UMU-d	charcoal	Monocotyledon tissue, Hernandia sonora	modern		-27.4 ±0.2		98.5±0.6	modern	modern	
	The sample was collected in 1995 from a pit oven just coverd by the surface soil, in Mata 'Ala site located at the entrance to Motu Uta, the reserve land of Roto Village. The details will be published from Keio University.												
WK-5083	ceremonial	PUK-W10-1A	pit (post hole)	charcoal	Monocotyledon tissue, Pandanus tectorius, Cocos nucifera	modern		-24.5 ±0.2		98.5±0.6	modern	modern	
	The sample was collected in 1995 from a pit, probably a post hole of Palenga Mata 'Ala (the guard's watchhouse of Mata 'Ala). The detail will be published from Keio University.												
WK-5084	ceremonial	PUK-W10-2A	7	charcoal	Timonius Polyanthus, Guettarda speciosa	modern		-26.2 ±0.2		98.5±0.7	modern	modern	
	The sample was collected in 1995 from a upper layer in an excavated trench at the center of Mata 'Ala, which contained dark brownish gray sand and coral gravel. The detail will be published from Keio University.												
WK-5085	ceremonial	PUK-W10-3A	8	charcoal	Monocotyledon tissue, Pandanus tectorius, Cocos nucifera, Timonius polyanthus	modern		-24.5 ±0.2		99.4 ±0.7	modern	modern	
	The sample was collected in 1995 from the upper part of Layer 8 containing dark gray sand and gravel, which would be spoil from the surrounding taro patch. The detail will be published from Keio University.												
WK-5087	ceremonial & subsistence	PUK-W10-2A	8+9'	charcoal	Monocotyledon tissue, Pandanus tectorius, Timonius polyanthus, Guettarda speciosa	210 ± 40		-24.3 ±0.2		97.4 ±0.5	1657 -1954	1644 - 1954	
	The sample was collected in 1995 from the lower part of Layer 8 and Layer 9 in Mata 'Ala site. The layer contained dark brownish gray sand and coral gravel, which would be the spoil from surrounding taro patches. The layer is associated with the construction of large uprights standing along the edge of a taro patch. The detail will be published from Keio University.												

RADIOCARBON AGES FROM PUKAPUKA ATOLL, COOK ISLANDS.

Code-No.	Site provenance			Sample features		Conventional age					Cal AD [2]		Location in the text
	Site type	Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
WK-5089	subsistence	PUK-W11	9	charcoal	Guettarda speciosa, Tournfortia argentia	630 ± 50		-26.5 ±0.2		92.4 ±0.6	1297 - 1401	1285 - 1417	
	The sample was collected in 1995 from a cultural layer in an excavated unit located on a taro patch bank. The layer contained brownish gray sand and coral gravel, which would be the spoil from a srounding taro patch. The date is associated with the period of construction of the taro patch. The details will be published from Keio University.												
WK-5088	subsistence	PUK-W11	13	charcoal	Timonius Polyanthus, Guettarda speciosa, Tournfortia argentia	650 ± 50		-27.1 ±0.2		92.2 ±0.6	1292 - 1396	1280 - 1408	28
	The sample was collected in 1995 from the lowest cultural layer in an excavated unit located on a taro patch bank. Some worked planks of turtle plastron were retrieved from this layer. The date would be associated with the construction of the taro patch. The details will be published from Keio University.												
Bata-10998	subsistence	PUK-W11	13	turtle	Chelonia mydas ?	910 ± 50		-17.9			1432 - 1516	1391 - 1627	
	The sample was collected in 1995 from the same layer which a charcoal sample of WK-5088. The conventional date is remarkedly earlier than that of WK-5088, but turtle remains would have suffered the marin reservoir effect. The calibrated date overlaps with that of WK-5088. The details will be published from Keio University.												
WK-4525	geomorphologic	PUK-W12	bed rock	coral	aragonite	4910 ± 60	-425.3 ±3.5	2.9±0.2	-457.4 ±4.0	54.3±0.4	BC3320-BC3081	BC3361-BC2992	27, 28, 219
	The sample was collected in 1995 from the bottom of a test excavated unit located in Ngake. The layer was consolidated algonite which would be the old reef flat. The details will be published from Keio University.												
N-5110	habitation	PUK-MKT02	4	charcoal		180 ± 60					modern	modern	
	The sample was collected in 1985 from an excavated unit in Motu Kotawa which was the reserve land of Yato Village. The detail of layer is unclear (Chikamori & Yoshida 1988).												

(1) Conventional ^{14}C ages are based on half-life of 5568 years, and applied with correction for isotopic fractionation apart from samples having laboratory-code "N".

(2) Calibrated ages are calculated with the CALIB 3.0. Samples originated from marine environment are calibrated with the ΔR (45.0±30.0)estimated from South Pacific .

(3) This value, the δ13 talue for WK-4524 (Tridacna), is applied for the calibration of ^{14}C ages originated from marine shells.

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
Beta-131264	ceremonial	RAR-012, Grid-E6	1-2	charcoal	-	modern					-	-	134
	The sample was retrieved from the surface soil (Layer 1) within the court of RAR-12 marae. However, The date would be associated with recent agricultural activities. The details will be published from Keio University.												
Beta-111774	ceremonial?	RAR-012, Grid-N10	pit oven	charcoal	-	710 ± 60		-29.8			AD1270-1305	AD1225-1400	
	The sample was retrieved from a large pit oven (umu) lying about 18 m to the east of RAR-12 marae on Motu Tapu. The date is probably associated with the early period of Rarotongan prehistory, along with beta-118204. The details will be published from Keio University.												
Beta-111775	ceremonial?	RAR-012, Grid-N10	pit oven	charcoal	-	720 ± 50		-27.6			AD1270-1300	AD1235-1315 AD1345-1390	
	The sample was retrieved from a large pit oven (umu) lying about 18 m to the east of RAR-12 marae on Motu Tapu. The date is probably associated with the early period of Rarotongan prehistory, along with beta-118204. The details will be published from Keio University.												
Beta-118204	habitation	RAR-012 (D9)	large pit	charcoal	Calophyllum inophyllum, Hibiscus tiliaceus, Coconut midrib?	1030 ± 50		-24.1			AD985-1030	AD905-920 AD950-1055 AD1090-1150	134
	The sample was retrieved from a large pit containing charcoal fragments. The pit lay close to RAR-12 marae on Motu Tapu. The date (AMS) is easrliest among radio carbon ages from Rarotonga. The details will be published from Keio University.												
NZ-788	ceremonial	RAR-022	7	charcoal		160 ± 70					AD1666-1700 AD1723-1789 AD1790-1817 AD1834-1879 AD1916-1940	AD1530-1547 AD1633-1948	134
	RAR-22, marae Manuka. Square 4, bottom of layer 7; sample expected to date first stage of formation of marae (Trotter 1974: 146).												
NZ-789	habitation	RAR-022	depth 120 cm	charcoal		650 ± 50					AD1294-1322 AD1351-1389	AD1281-1401	134
	RAR-22, marae Manuka. Depth 120cm in brown alluvial silt. Should date first felling and burning of Tupapa watershed (Trotter 1974: 146).												
NZ-794	dwelling	RAR-025	foundation of structure	charcoal		250 ± 60					AD1520-1585 AD1624-1677 AD1761-1803 AD1937-1941	AD1477-1696 AD1724-1816 AD1843-1872 AD1917-1943	
	RAR-25, community house, Pokata. Trench 2, foundation of structure (Trotter 1974: 146).												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
NZ-793	habitation	RAR-033	depth 50	charcoal		420 ± 60					AD1430-1512 AD1598-1615	AD1411-1531 AD1545-1634	134
	RAR-33, marae Pureora. Trench 2, depth 50 cm. Should date occupation immediately predating formation of marae (Trotter 1974: 146).												
NZ-792	dwelling, ceremonial	RAR-034	depth 25-30 cm	charcoal		240 ± 60					AD1524-1564 AD1628-1680 AD1738-1805 AD1933-1943	AD1485-1700 AD1723-1818 AD1832-1878 AD1915-1945	134
	RAR-34, Are Rangi. Trench 1, depth 25 - 30 cm. Should date formation of plantform of T-shape paepae (Trotter 1974: 146).												
ANU-1155	habitation	RAR-040	4	charcoal		720 ± 70					AD1226-1308 AD1361-1385	AD1189-1400	134
	The sample was collected from a earth oven (F3) associated with the lowest cultural layer (Layer 4) of RAR-40, Ngati Tiare Site (Bellwood 1978: 69).												
NZ-1919	habitation	RAR-040	4	charcoal		630 ± 60					AD1299-1325 AD1347-1392	AD1282-1414	
	The sample was collected from a feature (F7; earth oven ?) associated with the lowest cultural layer (Layer 4) of RAR-40, Ngati Tiare Site (Bellwood 1978: 69).												
NZ-1274	dwelling & cooking houses	RAR-040	3	charcoal		653 ± 73					AD1289-1326 AD1346-1393	AD1253-1423	
	The sample was collected from a large pit oven (F13) that apprears to have been inside the cooking house, which is associated with Layer 3 of RAR-40, Ngati Tiare Site (Bellwood 1978: 70).												
ANU-1154	habitation	RAR-040	3	charcoal		480 ± 70					AD1331-1342 AD1396-1484	AD1305-1369 AD1382-1525 AD1560-1630	
	The sample was collected from an open-air pit oven (F8), on the seaward side of the dwelling house in RAR-40, Ngati Tiare Site (Bellwood 1978: 71).												
NZ-1275	habitation	RAR-040	disturbance	charcoal		456 ± 71					AD1403-1506 AD1601-1613	AD1323-1349 AD1391-1534 AD1540-1635	
	The sample was collected from a context to be within the fill of the modern drainage ditch. The source of this sample before tis disturbance will never be known (Bellwood 1978: 72).												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
NZ-791	ceremonial	RAR-049		charcoal		170 ± 60					AD1662-1695 AD1725-1814 AD1846-1869 AD1918-1947	AD1651-1894 AD1904-1949	134
	RAR-49, Are Kariei. Square 05; sample taken just above basalt cobbling, should date first stage of construction (Trotter 1974: 146).												
NZ-1277	habitation	RAR-051 rock shelter	lower layer	charcoal		431 ± 58					AD1420-1510 AD1600-1614	AD1406-1528 AD1552-1632	
	The sample was collected from the lowest one of three successive hearths, which were found within the excavated trench of a rock shelter located on the Lower Maungaroa Valley. The date would relate to the period when the cluster of structures scattered on this lower valley was occupied (Bellwood 1978: 33-34).												
NZ-1922	habitation	RAR-051 rock shelter		shell		250 ± 40					-	-	
	The sample was collected from the shlf at the back of the rock shelter wall (Bellwood 1978: 33-34).												
NZ-1276	habitation	RAR-051 rock shelter	middle layer	charcoal		modern					-	-	
	The sample was collected from the middle one of three successive hearths, which were found within the excavated trench of a rock shelter located on the Lower Maungaroa Valley. The date would relate to the period when the cluster of structures scattered on this lower valley was occupied (Bellwood 1978: 33-34).												
ANU-1153	dwelling	RAR-051/10	hearth close to pavement	charcoal		200 ± 90					AD1641-1700 AD1722-1817 AD1833-1877 AD1916-1945	AD1508-1600 AD1615-1948	
	The sample was collected from a hearth that was located about 10 cm behind the northeastern corner of a small house platform in the Lower Maungaroa Valley. The date suggests that the house was in use just before European contact (Bellwood 1978: 24).												
NZ-796	habitation	RAR-053	pit oven	charcoal		450 ± 60					AD1408-1494	AD1330-1341 AD1396-1528 AD1554-1632	134
	RAR-53 (UM. 4) Maungaroa. Square E1, layers 6 -7 early oven (Trotter 1974: 146).												
NZ-797	habitation	RAR-053	pit oven	charcoal		330 ± 60					AD1502-1600 AD1612-1635	AD1448-1656	
	RAR-53 (UM. 4) Maungaroa. Square E1, sample from later oven (Trotter 1974: 146).												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
NZ-1217	habitation	RAR-053/6	pit oven	charcoal		613 ± 62					AD1302-1331 AD1336-1370 AD1377-1396	AD1287-1420	134
	The sample was collected from a large pit oven (1.05 m in diameter and 40 cm deep) on the Upper Moungaroa, which precedes the construction of a house platform. The date is would indicate that there was occupation of some kind in the upper valley in the 14th century (Bellwood 1978: 48).												
NZ-1216	dwelling	RAR-053/6	terrace surface	charcoal		264 ± 76					AD1494-1601 AD1612-1675 AD1774-1800	AD1452-1697 AD1724-1814 AD1841-1875 AD1917-1946	
	The sample was collected from the terrace surface beneath a dwelling house (Bellwood 1978: 206). The date would relate directly to the occupation of the house (Bellwood 1978: 49).												
NZ-1278	dwelling	RAR-053/6	terrace surface	charcoal		226 ± 68					AD1525-1561 AD1629-1690 AD1728-1811 AD1921-1943	AD1493-1602 AD1612-1887 AD1910-1945	
	The sample was collected from the terrace surface beneath a dwelling house (Bellwood 1978: 206). The date would relate directly to the occupation of the house (Bellwood 1978: 49).												
Beta-131265	ceremonial	RAR-105	pit oven	charcoal		120 ± 50					AD1682-1736 AD1808-1891 AD1907-1932	AD1670-1779 AD1797-1943	134
	The sample was collected from a large pit oven discovered within the court of RAR-105 marae located on a inland ridge of Turangi Valley. The detail will be published from Keio University.												
Beta-131263	subsistence	RAR-108	2	charcoal		170 ± 50					AD1662-1694 AD1726-1814 AD1851-1854 AD1919-1943	AD1651-1891 AD1906-1944	
(AMS)	The sample was collected from the yellowish gray soil (Layer 2), probably waterlogged during the use of inland terraces within RAR-108 for wet-taro cultivation. The detail will be published from Keio University.												
N-5858	habitation	Ngt-1, Unit.3	large pit	charcoal		380 ± 80					AD1445-1524 AD1564-1627	AD1413-1658	
	The sample was collected from the fill of a large pit sunk into the coral bed rock (old reef flat) and covered with Layer 2 (brownish black soi), which appears to have been a well. The details will be published from Keio University.												
N-5860	habitation	Ngt-1, Unit.6	3	charcoal		410 ± 70					AD1432-1519 AD1587-1624	AD1415-1637	
	The sample was collected from Layer 3 (dark brown soil) expanding the area of site Ngt-1 and just lying on the yellowish gray sand (Layer 4). The detail will be published from Keio University.												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
N-5859	habitation	Ngt-1	4?	charcoal		modern					-	-	
	The sample was collected from Layer 4 of yellowish gray sand, but the date is problematic because this layer contained no cultural materials. The sample would have fell down from the top soil in the process of excavation.												
N-5879	geomorphic	Ngt-1, Unit.4	5	shell	Tridacna sp.	4210 ± 80			45.0±30.0		BC2407-2177	BC2487-2034	
	The sample was collected from Layer 5 of fine yellowish gray sand to investigate the accumulation of beach sand before human settlement. The details will be published from Keio University.												
N-5878	geomorphic	Ngt-1	6 (bedrock)	shell	Tridacna sp.	2950 ± 75					BC805-600	BC888-469	
	The sample was collected from aragonite bedrock derived from old coral reef flat to investigate the high stand sea level in the past (Chikamori 1995b: 8). The details will be published from Keio University.												
N-5861	habitation	Ngt-2	2	charcoal		230 ± 70					AD1523-1568 AD1627-1688 AD1729-1810 AD1923-1941	AD1489-1886 AD1911-1943	
	The sample was collected just beneath a concentration of basalt and coral rocks which was associtated with layer 2. The details will be published from Keio University.												
N-5862	stone tool factory?	Ngt-3 (RAR-16)	3	charcoal		360 ± 70					AD1465-1527 AD1554-1632	AD1434-1654	134, 138
	The sample was collected from the layer of brow alluvial soil, just lying beneath the cultural layer (Layer 2) containing many stone flakes. The details will be published from Keio University.												
N-6175	habitation	Ngt-4 rock shelter	2	charcoal		110 ± 70					AD1683-1734 AD1809-1929	AD1667-1945	
	The sample was collected from the layer of brownish black soil (Layer 2) partially covered with a layer of reddish grains fallen from the wall of a rock shelter (Chikamori 1995: Fig. 9).The details will be published from keio University.												
N-6174	habitation	Ngt-4 rock shelter	2	charcoal		160 ± 70					AD1666-1700 AD1723-1789 AD1790-1817 AD1834-1879 AD1916-1940	AD1530-1547 AD1633-1948	
	The sample was collected from the lower part of layer 2 (Chikamori 1995: Fig. 9).The details will be published from keio University.												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1 σ	2 σ	
N-6172	habitation	Ngt-4 rock shelter	pit oven 1	charcoal		200 ± 75					AD1642-1696 AD1725-1815 AD1844-1873 AD1918-1944	AD1518-1591 AD1622-1947	
	The sample was collected from a pit oven dug from Layer 2 (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6177	habitation	Ngt-4 rock shelter	pit oven 1	charcoal		250 ± 85					AD1511-1599 AD1615-1682 AD1736-1806 AD1930-1941	AD1463-1886 AD1911-1944	
	The sample was collected from a pit oven dug from Layer 2 (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6662	habitation	Ngt-4 rock shelter	3	charcoal		310 ± 75					AD1493-1606 AD1609-1648	AD1437-1679 AD1742-1804 AD1934-1945	
	The sample was collected from the layer of brownish black soil (Layer 3) covered with a layer of reddish grains fallen from the wall of the rock shelter (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6173	habitation	Ngt-4 rock shelter	4	charcoal		270 ± 110					AD1482-1678 AD1745-1803 AD1935-1939	AD1444-1713 AD1718-1884 AD1912-1949	
	The sample was collected from the thin layer of brownish black soil (Layer 4) lying between layers of reddish grains fallen from the wall of the rock shelter (Chikamori 1995: Fig. 9). The details will be published from keio University.												
N-6180	habitation	Ngt-4 rock shelter	pit oven 2	charcoal		310 ± 80					AD1489-1650	AD1434-1683 AD1734-1807 AD1930-1944	
	The sample was collected from a large pit oven dug from the surface of Layer 5 (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6176	habitation	Ngt-4 rock shelter	pit oven 2	charcoal		360 ± 80					AD1463-1528 AD1552-1631	AD1417-1667 AD1783-1790	
	The sample was collected from a large pit oven dug from the surface of Layer 5 (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6178	habitation	Ngt-4 rock shelter	pit oven 2	charcoal		360 ± 75					AD 1464-1527 AD1553-1630	AD1426-1661	
	The sample was collected from a large pit oven dug from the surface of Layer 5 (Chikamori 1995: Fig. 9). The details will be published from Keio University.												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD [2]		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP [1]	d^{14}C‰	δ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
N-6179	habitation	Ngt-4 rock shelter	5	charcoal		430 ± 95					AD1413-1522 AD1575-1626	AD1313-1358 AD1387-1656	
	The sample was collected from the lowest cultural layer of brownish black soil covered with a reddish grain fallen from the wall of the rock shelter (Chikamori 1995: Fig. 9). The details will be published from keio University.												
N-6171	habitation	Ngt-4 rock shelter	5	charcoal		440 ± 80					AD1409-1518 AD1592-1622	AD1325-1348 AD1392-1643	
	The sample was collected from the lowest cultural layer of brownish black soil covered with a reddish grain fallen from the wall of the rock shelter (Chikamori 1995: Fig. 9). The details will be published from keio University.												
N-6170	habitation	Ngt-4 rock shelter	5	charcoal		450 ± 70					AD1406-1508 AD1601-1613	AD1327-1346 AD1393-1637	
	The sample was collected from the lowest cultural layer of brownish black soil covered with a reddish grain fallen from the wall of the rock shelter (Chikamori 1995: Fig. 9). The details will be published from keio University.												
N-6661	habitation	Ngt-4 rock shelter	pit oven 3	charcoal		550 ± 90					AD1307-1365 AD1384-1436	AD1277-1510 AD1600-1614	134
	The sample was collected from a pit oven dug from the middle of Layer 5 into the basal layer (Layer 6) of reddish brown alluvial soil (Chikamori 1995: Fig. 9). The details will be published from Keio University.												
N-6182	habitation	Ngt-5	2	charcoal		380 ± 70					AD1446-1521 AD1574-1626	AD1427-1647	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												
N-6181	habitation	Ngt-5	3	charcoal		370 ± 70					AD1453-1523 AD1564-1628	AD1432-1649	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												
N-6183	habitation	Ngt-5	cut 07	charcoal		290 ± 70					AD1498-1602 AD1613-1660	AD1444-1684 AD1734-1808 AD1928-1941	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												

RADIOCARBON AGES FROM RAROTONGA, COOK ISLANDS.

Code-No.	Site class	Site provenance		Sample features		Conventional age					Cal AD (2)		Location in the text
		Site code	Layer	Material	Species / Type	^{14}C yBP (1)	d^{14}C‰	δ ^{13}C‰	D^{14}C‰	%Modern	1σ	2σ	
N-6184	habitation	Ngt-5	cut 08	charcoal		380 ± 70					AD1446-1521 AD1574-1626	AD1427-1647	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												
N-6185	habitation	Ngt-5	cut 11	charcoal		450 ± 75					AD1405-1515 AD1598-1617	AD1327-1346 AD1393-1636	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												
N-6186	habitation	Ngt-5	cut 16	charcoal		470 ± 105					AD1324-1348 AD1391-1520 AD1587-1624	AD1301-1371 AD1372-1638	
	The details will be published from Pro. Okajima, Tokyo Gakuen Women's College, who excavated this site.												
Beta-100723	geomorphic	Ngt-6		plant material	-	5980 ± 80		-27.7					
	The sample was collected from the bottom of peat soil layer within a test trench located on the floodplain of Avana Stream. The date is probably associated with the high stand sea level around 6000 BP. The details will be published from Keio University.												
Beta-111772	geomorphic	Mat-2	3	plant material	Hibiscus sp.	2860 ± 60		-33.4			BC1110-BC925	BC1200-BC855	
	The sample is a flagment of Hibiscus trunk water-logged in the peat soil of a wet taro field in Matavera Village. The date will be related to the period of the formaion of back mursh and front beach ridge around Rarotongan coastal area. The details will be published from Keio University.												
Beta-111773	geomorphic	-	-	fossilized coral		27690 ± 220		-8.8			-	-	
	The sample was collected from a fossilized makatea rock (raised coral). The rock was located between Tupapa and Matavera streams. The details will be published from Keio University.												

(1) Conventional ^{14}C ages are based on half-life of 5568 years, and applied with correction for isotopic fractionation apart from samples having laboratory-code "N", "NZ", "ANU-1153", "ANU-1154" and "ANU-1155".

(2) Calibrated ages are calculated with the CALIB 4.2. Samples originated from marine environment are calibrated with the ΔR (45.0±30.0)estimated from South Pacific .

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